

DEEPWATER HORIZON OIL SPILL

LOUISIANA TRUSTEE IMPLEMENTATION GROUP DRAFT RESTORATION PLAN AND ENVIRONMENTAL ASSESSMENT #4: NUTRIENT REDUCTION (NONPOINT SOURCE) AND RECREATIONAL USE

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EXECUTIVE SUMMARY

On April 20, 2010, the Deepwater Horizon (DWH) mobile drilling unit exploded, caught fire, and eventually sank in the Gulf of Mexico, resulting in a massive release of oil and other substances from BP Exploration and Production's (BP) Macondo well and causing loss of life and extensive natural resources injuries. Initial efforts to cap the well following the explosion were unsuccessful, and for 87 days after the explosion, the well continuously and uncontrollably discharged oil and natural gas into the northern Gulf of Mexico. Approximately 3.19 million barrels (134 million gallons) of oil were released into the ocean (U.S. District Court for the Eastern District of Louisiana 2016). Oil spread from the deep ocean to the ocean surface and nearshore environment from Texas to Florida. The oil came into contact with, and injured, diverse natural resources such as deep-sea coral, fish and shellfish, productive wetland habitats, sandy beaches, birds, endangered sea turtles, and protected marine life. The oil spill prevented people from fishing, going to the beach, and enjoying typical recreational activities along the Gulf of Mexico. Extensive response actions, including cleanup activities and actions to try to prevent the oil from reaching sensitive resources, were undertaken to try to reduce harm to people and the environment. However, many of these response actions had collateral impacts on the environment and on natural resource services. The oil and other substances released from the well in combination with the extensive response actions together make up the DWH Oil Spill.

As an oil pollution incident, the DWH Oil Spill is subject to the provisions of the Oil Pollution Act (OPA) of 1990, which makes parties responsible for an oil spill liable for the costs of responding to and cleaning up the spill, as well as the costs of assessment and restoration needed to compensate for injuries to natural resources and the services they provide. OPA specifies that trustees responsible for representing the public's interest (in this case, state and federal agencies) must be designated to act on behalf of the public to assess the injuries and to address those injuries.

As required under OPA, the DWH Oil Spill Trustees (DWH Trustees) conducted a natural resource damage assessment (NRDA) and prepared the *Deepwater Horizon Oil Spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement* (Final PDARP/PEIS) (DWH Trustees 2016). The DWH Trustees conducted a NRDA to

- assess the impacts of the DWH Oil Spill on natural resources in the Gulf of Mexico and the services those resources provide, and
- determine the type and amount of restoration needed to compensate the public for these impacts.

Following the NRDA, the DWH Trustees determined that the injuries caused by the DWH Oil Spill could not be fully described at the level of a single species, a single habitat type, or a single region. Rather, the injuries affected such a wide array of linked resources over such an enormous area that the effects of the DWH Oil Spill must be described as constituting an ecosystem-level injury. Consequently, the DWH Trustees proposed a comprehensive, integrated ecosystem restoration plan with a portfolio of restoration types that addresses the diverse suite of injuries that occurred at both regional and local scales, based on the following five overarching goals:

1. Restore and conserve habitat
2. Restore water quality
3. Replenish and protect living coastal and marine resources
4. Provide and enhance recreational opportunities
5. Provide for monitoring, adaptive management, and administrative oversight to support restoration implementation

These five goals work both independently and together to restore injured resources and services, as demonstrated in the following two excerpts from the Final PDARP/PEIS (DWH Trustees 2016):

- The goal of restoring water quality recognizes the intricate linkages between improving water quality, the health and resilience of coastal and marine habitats and resources, and the public's use of those resources.
- The goal of providing and enhancing recreational opportunities takes into account the myriad ways that the human community interacts with the natural environment. This goal involves improving on those experiences by maintaining healthy coastal and marine habitats and resources, increasing public access, and enhancing the quality of recreational activities.

Draft Restoration Plan and Environmental Assessment

This document, herein referred to as the *Louisiana Trustee Implementation Group Draft Restoration Plan/ Environmental Assessment #4: Nutrient Reduction (Nonpoint Source) and Recreational Use* and abbreviated as RP/EA, was prepared by the Louisiana Trustee Implementation Group (LA TIG) pursuant to OPA and is consistent with the DWH Trustees' findings in the Final PDARP/PEIS. The LA TIG comprises five Louisiana state trustee agencies and four federal trustee agencies:

- Louisiana Coastal Protection and Restoration Authority (CPRA)
- Louisiana Department of Natural Resources (LDNR)
- Louisiana Department of Environmental Quality (LDEQ)
- Louisiana Oil Spill Coordinator's Office (LOSCO)
- Louisiana Department of Wildlife and Fisheries (LDWF)
- U.S. Department of Commerce, represented by the National Oceanic and Atmospheric Administration (NOAA)
- U.S. Department of the Interior (DOI), represented by the U.S. Fish and Wildlife Service (USFWS) and National Park Service (NPS)
- U.S. Department of Agriculture (USDA)
- U.S. Environmental Protection Agency (EPA)

In accordance with 40 Code of Federal Regulations (CFR) 1508.12, the LA TIG designated EPA as the lead federal agency responsible for National Environmental Policy Act (NEPA) compliance for this RP/EA. The federal and state agencies of the LA TIG are acting as cooperating agencies for the purposes of compliance with NEPA in the development of this RP/EA. Each federal cooperating agency on the LA TIG intends to adopt, if appropriate, the NEPA analyses in this RP/EA. In accordance with 40 CFR 1506.3(a), each of the three federal cooperating agencies (DOI, NOAA, and USDA) participating on the LA TIG will review this RP/EA for adequacy in meeting the standards set forth in each agency's specific NEPA implementing procedures and decide whether to adopt the analysis in this RP/EA. Adoption of this RP/EA would be completed via signature on the relevant NEPA decision document.

The LA TIG has an allocation of \$5 billion for restoration activities in the Louisiana Restoration Area, which includes Early Restoration projects approved prior to the settlement with BP in 2016. Because of the significant injury to recreational use services as a result of the DWH Oil Spill, \$20 million of these funds are dedicated to the Nutrient Reduction (Nonpoint Source) restoration type, and \$60 million of these total funds are dedicated to the Provide and Enhance Recreational Opportunities restoration type.

One focus of this RP/EA is implementation of the Final PDARP/PEIS restoration type, Nutrient Reduction (Nonpoint Source). This restoration type is intended to reduce nutrient pollution and provide ecosystem-scale benefits to coastal habitats and resources chronically threatened by nutrients and co-pollutants causing water quality degradation. Excess nutrient inputs to Louisiana's coastal estuaries are associated

with harmful algal blooms and oxygen depleted waters, i.e., hypoxic zones. Algal blooms and hypoxic zones in turn negatively impact the spawning habitats and food sources on which the region's economically valuable fisheries rely (Mississippi River/Gulf of Mexico Watershed Nutrient Task Force 2015).

Another focus of this RP/EA is implementation of the PDARP/PEIS restoration type, Provide and Enhance Recreational Opportunities. This restoration type is intended to address recreational use loss as a result of the DWH Oil Spill, including restricted and decreased access to recreational fishing and camping opportunities among other outdoor recreational activities. Impacts from the DWH Oil Spill include oiled shorelines, the closure of fishing and recreational areas, and the cancellation of recreational trips. These impacts resulted in losses to the public's use of natural resources for outdoor recreation, including fishing, boating, vacationing, camping, beach going, and other recreational activities. These impacts affected the entire Louisiana shoreline (DWH Trustees 2016:Chapter 4).

In developing this RP/EA's reasonable range of alternatives, the LA TIG considered the following:

- OPA screening criteria
- Specific goals identified in the Final PDARP/PEIS under the Provide and Enhance Recreational Opportunities and Nutrient Reduction (Nonpoint Source) Restoration Types
- Other criteria identified by the DWH Trustees
- Input from the public
- The current and future availability of funds under the DWH Oil Spill NRDA settlement payment schedule

In total, the LA TIG identified 31 projects in the range of reasonable alternatives in addition to the No Action Alternative. These projects are intended to provide nutrient reduction benefits and address recreational use loss in the Louisiana Restoration Area.

Nutrient reduction projects considered in this RP/EA would help restore and enhance the ecological and hydrological integrity of the state's coastal watersheds by reducing rural nonpoint source pollution through the implementation of conservation practices (CPs) on agricultural lands. Projects restoring lost recreational use emphasize the creation and enhancement of recreational infrastructure, enhanced recreational access or opportunity, and educational and outreach components that promote use of the natural resources and encourage conservation and stewardship for them, consistent with the injuries caused by the DWH Oil Spill. After evaluating all 31 projects included in the reasonable range of alternatives, the LA TIG is proposing 23 of these projects (four of eight nutrient reduction projects and 19 of 23 recreational use projects) as preferred alternatives for implementation.

Tables ES-1 and ES-2 identify the projects evaluated in this RP/EA and which of those projects are being proposed as preferred alternatives for implementation.

Table ES-1. Nutrient Reduction Alternatives

Alternative Name	Location (Parish)	Preferred Alternative
Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes	St. Helena and Tangipahoa	Yes
Nutrient Reduction on Dairy Farms in Washington Parish	Washington	Yes
Nutrient Reduction on Cropland and Grazing Land in Bayou Folse	Lafourche and Terrebonne	Yes
Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes	Concordia, Catahoula, and Tensas	No
Nutrient Reduction on Cropland and Grazing Land in Iberia, St. Mary, and Vermilion Parishes	Iberia, St. Mary, and Vermilion	No

Alternative Name	Location (Parish)	Preferred Alternative
Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices	Vermilion and Cameron	Yes
Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes	St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis	No
Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes	Concordia, Tensas, and Catahoula	No

Table ES-2. Recreational Use Alternatives

Alternative Name	Location (Parish)	Preferred Alternative
Pass-a-Loutre Wildlife Management Area Crevasse Access	Plaquemines	Yes
Pass-a-Loutre Wildlife Management Area Campgrounds	Plaquemines	Yes
Grand Isle State Park Improvements	Jefferson	Yes
Chitimacha Boat Launch	St. Mary	Yes
Sam Houston Jones State Park Improvements	Calcasieu	Yes
Pointe-aux-Chenes Wildlife Management Area Recreational Use Enhancement	Terrebonne	Yes
WHARF Phase 1	Jefferson	Yes
Bayou Segnette State Park Improvements	Jefferson	Yes
Atchafalaya Delta Wildlife Management Area Access	St. Mary	Yes
Atchafalaya Delta Wildlife Management Area Campgrounds	St. Mary	Yes
Rockefeller Piers and Rockefeller Signage	Cameron	Yes
St. Bernard State Park Improvements	St. Bernard	Yes
Cypremort Point State Park Improvements	St. Mary	Yes
The Wetlands Center	Jefferson	Yes
Recreational Use Improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit	Jefferson	Yes
Des Allemands Boat Launch	St. Charles	Yes
Middle Pearl	St. Tammany	Yes
Improvements to Grand Avoille Boat Launch	St. Mary	Yes
Belle Chasse	Plaquemines	Yes
Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin	Jefferson	No
Palmetto Island State Park Improvements	Vermilion	No
Louisiana Swamp Exhibit at Audubon Zoo	Orleans	No
Louisiana Wetlands Gallery at Audubon Aquarium	Orleans	No

The LA TIG has evaluated the environmental consequences of the projects comprising the reasonable range of alternatives, and the preliminary findings indicate that no significant environmental impacts are anticipated within the context of NEPA. The LA TIG has prepared this RP/EA to inform the public about DWH NRDA restoration planning efforts and to seek public comment on the reasonable range of alternatives, including the 23 preferred alternatives and the preliminary finding of no significant impact.

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Abbreviations

ADA	Americans with Disabilities Act
AQI	air quality index
BLM	Bureau of Land Management
BMP	best management practice
BP	BP Exploration and Production
CAA	Clean Air Act
CCA	Coastal Conservation Association
CEAP	Conservation Effects Assessment Program
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNMP	comprehensive nutrient management plan
CP	conservation practice
CPRA	Coastal Protection and Restoration Authority
CRP	Conservation Reserve Program
CWA	Clean Water Act
CWPPRA	Coastal Wetlands Planning, Protection and Restoration Act
DWH	Deepwater Horizon
DWH Trustees	DWH Oil Spill Trustees
E&D	engineering and design
EA	environmental assessment
EFH	essential fish habitat
EO	executive order
EQIP	Environmental Quality Incentives Program
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
Final PDARP/PEIS	<i>Deepwater Horizon Oil Spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement</i>
FIP	Facility Improvement Plan
FONSI	finding of no significant impact
GHG	greenhouse gas
HUC	hydrologic unit code
JLNHPP	Jean Lafitte National Historical Park and Preserve

LA TIG	Louisiana Trustee Implementation Group
LAA	limited access area
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDWF	Louisiana Department of Wildlife and Fisheries
LMFERSC	Louisiana Marine Fisheries Enhancement, Research, and Science Center
LOSCO	Louisiana Oil Spill Coordinator's Office
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended
MAM	monitoring and adaptive management
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act of 1972
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	notice of intent
NORTA	New Orleans Regional Transit Authority
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRDA	natural resource damage assessment
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OPA	Oil Pollution Act of 1990
PAC	Pointe-aux-Chenes
PCCP	Portland Cement Concrete Pavement
PCE	primary constituent element
Phase III ERP/PEIS	Phase III Early Restoration Plan and Programmatic Environmental Impact Statement
PM10	particulate matter 10
PM2.5	particulate matter 2.5
ppt	part per thousand

RESTORE Act	Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act
ROD	record of decision
RP	restoration plan
RP/EA	restoration plan/environmental assessment
RS	Revised Statutes
RWR	Rockefeller Wildlife Refuge
SAV	submerged aquatic vegetation
SWPPP	stormwater pollution prevention plans
TIG	Trustee Implementation Group
Trustee Council SOP	<i>Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill</i>
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
DOI	U.S. Department of the Interior
EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WHIP	Wildlife Habitat Incentives Program
WMA	Wildlife Management Area
WRP	Wetlands Reserve Program

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1 INTRODUCTION

The Louisiana Trustee Implementation Group (LA TIG) prepared this draft restoration plan/environmental assessment (RP/EA), *Louisiana Trustee Implementation Group Draft Restoration Plan and Environmental Assessment #4: Nutrient Reduction (Nonpoint Source) and Recreational Use*, to address both nutrient reduction (nonpoint source) within Louisiana’s coastal watersheds and lost recreational use opportunities in the State of Louisiana resulting from the Deepwater Horizon (DWH) Oil Spill. This RP/EA was prepared by the federal and state natural resource trustees for the LA TIG, which is responsible for restoring the natural resources and services within the Louisiana Restoration Area that were injured by the April 20, 2010, DWH Oil Spill. The Louisiana Restoration Area includes the entire state of Louisiana.

The LA TIG comprises five Louisiana state trustee agencies and four federal trustee agencies: the Coastal Protection and Restoration Authority (CPRA), Louisiana Department of Environmental Quality (LDEQ), Louisiana Department of Natural Resources (LDNR), Louisiana Department of Wildlife and Fisheries (LDWF), Louisiana Oil Spill Coordinator’s Office (LOSCO), National Oceanic and Atmospheric Administration (NOAA), U.S. Department of the Interior (DOI), U.S. Department of Agriculture (USDA), and U.S. Environmental Protection Agency (EPA).

The LA TIG has prepared this RP/EA to inform the public about DWH natural resource damage assessment (NRDA) restoration planning efforts and to seek public comment on the reasonable range of alternatives for engineering and design (E&D) and construction (henceforth “implementation”), in this RP/EA (see Section 1.10 for details).

Restoration activities, as discussed in this RP/EA and detailed more fully in the *Deepwater Horizon Oil Spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement* (Final PDARP/PEIS) (DWH Oil Spill Trustees [DWH Trustees] 2016), are proposed to make the environment and the public whole for injuries resulting from the incident by implementing restoration actions that return injured natural resources and services to baseline conditions and compensate for interim losses in accordance with the Oil Pollution Act of 1990 (OPA) and associated NRDA regulations. The Final PDARP/PEIS and record of decision (ROD) can be found online at <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan> (DWH Trustees 2016).

1.1 Background and Summary of the Settlement

On April 20, 2010, the DWH mobile drilling unit exploded, caught fire, and eventually sank in the Gulf of Mexico, resulting in a massive release of oil and other substances from BP Exploration and Production’s (BP) Macondo well and causing loss of life and extensive natural resource injuries. The oil spill also prevented people from enjoying typical recreational activities, such as fishing and spending time on the beach, along the Gulf of Mexico. Extensive response actions, including cleanup activities and actions to try to prevent the oil from reaching sensitive resources, were undertaken to try to reduce harm to people and the environment. However, many of these response actions had collateral impacts on the environment and natural resource services. The oil and other substances released from the well, in combination with the extensive response actions, together make up the DWH Oil Spill.

The DWH Oil Spill occurred within a northern Gulf of Mexico ecosystem where ecological resources and habitats are closely linked. Energy, nutrients, and organisms move between habitats in this region, such that injuries to one habitat or species can have cascading impacts across the entire ecosystem (DWH Trustees 2016:Section 3). As part of the injury assessment for the DWH Oil Spill, the DWH Trustees documented injuries to species including shrimp, fish, shellfish, birds, and marine mammals. These

injuries ranged from decreased growth rates to reproductive effects and mortality. Many of these injured species depend on the nearshore marsh and estuarine habitats exemplified by those in the Barataria Basin for one or more of their life stages.

On February 19, 2016, the DWH Trustees issued the Final PDARP/PEIS (DWH Trustees 2016) detailing a specific proposed plan to fund and implement restoration projects across the Gulf of Mexico region into the future as restoration funds become available. The Final PDARP/PEIS describes restoration types, approaches, and techniques that meet the Trustee programmatic restoration goals. On March 29, 2016, in accordance with OPA and NEPA, the DWH Trustees issued a notice of availability of a ROD for the Final PDARP/PEIS in the *Federal Register* (NOAA Fisheries 2016a). Based on the DWH Trustees' injury determination established in the Final PDARP/PEIS, the ROD sets forth the basis for the DWH Trustees' decision to select Alternative A: Comprehensive Integrated Ecosystem Alternative. As described in the PDARP/PEIS, "Alternative A is an integrated restoration portfolio that emphasizes the broad ecosystem benefits that can be realized through coastal habitat restoration in combination with resource-specific restoration in the ecologically interconnected northern Gulf of Mexico ecosystem" (DWH Trustees 2016:5-17). The DWH Trustees' selection of Alternative A includes the funding allocations established in the Final PDARP/PEIS.

On April 4, 2016, the United States District Court for the Eastern District of Louisiana entered a Consent Decree resolving civil claims by the DWH Trustees against BP arising from the DWH Oil Spill. This historic settlement resolves the DWH Trustees' claims against BP for natural resources damages under OPA.

Under the Consent Decree, BP agreed to pay, over a 15-year period, a total of \$8.1 billion in natural resource damages (which includes \$1 billion that BP previously committed to pay for Early Restoration projects) and up to an additional \$700 million (some of which is in the form of accrued interest) for adaptive management or to address injuries to natural resources that are presently unknown but may come to light in the future. Each restoration area has a specific monetary allocation to each of the 13 restoration types specified in the Consent Decree. The DWH settlement allocation for the LA TIG by restoration type is described in Section 5.10.2 of the Final PDARP/PEIS (DWH Trustees 2016). Funds allocated to the Louisiana Restoration Area for the Nutrient Reduction (Nonpoint Source) restoration type are \$20 million, and funds allocated to the Louisiana Restoration Area for the Provide and Enhance Recreational Opportunities restoration type are \$38 million. These allocations do not include funds allocated for Early Restoration projects. More details on the background of the DWH Oil Spill, the impact of the spill on the Gulf of Mexico ecosystem, and additional context for the settlement and allocation of funds can be found in Chapter 2 of the Final PDARP/PEIS.

1.2 Deepwater Horizon Trustees, Trustee Council, and Trustee Implementation Groups

The DWH Trustees are the government entities authorized under OPA to act as trustees on behalf of the public to assess the natural resource injuries resulting from the DWH Oil Spill and to develop and to implement a restoration plan to compensate for those injuries. DWH Trustees fulfill these responsibilities by developing restoration plans, providing the public with a meaningful opportunity to suggest restoration projects and to review and comment on proposed plans, implementing and monitoring restoration projects, managing natural resource damage funds, and documenting trustee decisions through a public administrative record. The DWH Trustees are responsible for governance of restoration planning throughout the entire Gulf Coast.

As required under OPA, the DWH Trustees conducted a natural resource damage assessment (NRDA). To work collaboratively on the NRDA, the DWH Trustees organized a Trustee Council composed of Designated Natural Resource Trustee Officials, or their alternates, for each of the DWH Trustee agencies. The following federal and state agencies are the designated DWH Trustees under OPA for the DWH Oil Spill:

- NOAA, on behalf of the U.S. Department of Commerce
- DOI, as represented by the National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), and Bureau of Land Management
- EPA
- USDA
- The State of Alabama's Department of Conservation and Natural Resources and Geological Survey of Alabama
- The State of Florida's Department of Environmental Protection and Fish and Wildlife Conservation Commission
- The State of Louisiana's CPRA, LOSCO, LDEQ, LDWF, and LDNR
- The State of Mississippi's Department of Environmental Quality
- The State of Texas' Parks and Wildlife Department, General Land Office, and Commission on Environmental Quality

The DWH NRDA funds awarded under the Consent Decree were distributed geographically to address the diverse suite of injuries that occurred at both regional and local scales. As specified in the Consent Decree and Final PDARP/PEIS, specific amounts of money were allocated to seven geographic areas: each of the five Gulf States (Texas, Louisiana, Mississippi, Alabama, and Florida), nationwide, and the open ocean. The funding distribution was based on the DWH Trustees' understanding and evaluation of exposure and injury to natural resources and services, as well as their evaluation of where restoration spending for the various restoration types would be most beneficial within the ecosystem-level restoration portfolio.

1.3 Authorities and Regulations

1.3.1 Oil Pollution Act Compliance

As an oil pollution incident, the DWH Oil Spill is subject to the provisions of OPA (33 United States Code [USC] 2701 et seq.). A primary goal of OPA is to make the environment and public whole for injuries to natural resources and services resulting from an incident involving an oil discharge or substantial threat of an oil discharge. Under OPA, each party responsible for a vessel or facility from which oil is discharged, or which poses the substantial threat of a discharge, is liable for, among other things, removal costs and damages for injury to, destruction of, loss, or loss of use of natural resources, including the reasonable cost of assessing the damage.

This process of injury assessment and restoration planning is referred to as NRDA. NRDA is described under Section 1006 of OPA (33 USC 2706 et seq.). Under the OPA NRDA regulations (15 Code of Federal Regulations [CFR] 990 et seq.), the NRDA process consists of three phases: 1) Pre-assessment, 2) Restoration Planning, and 3) Restoration Implementation. The DWH Trustees are currently in the Restoration Planning and the Restoration Implementation phases of the NRDA. As part of the initiation of restoration implementation, this RP/EA identifies potential alternatives, evaluates those alternatives under various criteria, and identifies a suite of alternatives that would compensate the public for lost recreational use and adverse effects to coastal watershed health in Louisiana caused by the DWH Oil Spill.

1.3.2 National Environmental Policy Act Compliance

Under the OPA regulations, federal trustees must comply with the National Environmental Policy Act (NEPA), 42 USC 4321 et seq. and its regulations, 40 CFR 1500 et seq., among others when planning restoration projects. NEPA requires federal agencies to consider the potential environmental impacts of planned actions. NEPA provides a framework for federal agencies to determine if their proposed actions have significant environmental effects and related social and economic effects, to consider these effects when choosing between alternatives, and to inform and involve the public in the environmental analysis and decision-making process.

NEPA and its implementing regulations (40 CFR 1500–1508, and agency-specific NEPA regulations) outline the responsibilities of federal agencies in the NEPA process. In this RP/EA, the LA TIG addresses these requirements by using the environmental analyses conducted in the Final PDARP/PEIS, evaluating and refining existing analyses, and preparing environmental consequences analyses for projects (or alternatives considered in this RP/EA) as appropriate. See Chapter 6 of the PDARP/PEIS for more information on tiering and incorporation by reference under NEPA and how they apply to this RP/EA (DWH Trustees 2016).

Consistent with 40 CFR 1508.16, the LA TIG designated EPA as the lead federal agency responsible for NEPA compliance for this RP/EA. The federal and state agencies of the LA TIG are acting as cooperating agencies for the purposes of NEPA in the development of this RP/EA. Each federal cooperating agency on the LA TIG intends to comply with NEPA by adopting, if appropriate, the analysis in this RP/EA. In accordance with 40 CFR 1506.3(a), each of the three federal cooperating agencies (DOI, NOAA, and USDA) participating in the LA TIG will review this RP/EA for adequacy in meeting the standards set forth in its own NEPA implementing procedures. Adoption of the EA would be completed via signature on the relevant NEPA decision document. There are no other cooperating federal, state, or local entities, or tribes.

This RP/EA includes a preliminary finding of no significant impact (FONSI) in Section 6.3.1. EPA’s NEPA implementing procedures at 40 CFR 6.203(b)(1) state that “At least thirty (30) calendar days before making the decision on whether, and if so how, to proceed with a proposed action, the Responsible Official must make the EA and preliminary FONSI available for review and comment to the interested federal agencies, state and local governments, federally-recognized Indian tribes and the affected public. The Responsible Official must respond to any substantive comments received and finalize the EA and FONSI before making a decision on the proposed action.”

More information about OPA and NEPA, as well as their application to DWH Oil Spill restoration planning, can be found in Chapters 5 and 6 of the Final PDARP/PEIS (DWH Trustees 2016).

1.3.3 Standard Operating Procedures Compliance

Another document that guides restoration planning is the 2016 *Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill* (Trustee Council 2016). The Trustee Council developed the standard operating procedures (SOPs) for administration, implementation, and long-term management of restoration under the Final PDARP/PEIS. The Trustee Council SOP documents the overall structure, roles, and decision-making responsibilities of the Trustee Council and provides the common procedures to be used by all TIGs. The Trustee Council SOP addresses, among other issues, the following topics: decision-making and delegation of authority, funding, administrative procedures, project reporting, monitoring and adaptive management (MAM), consultation opportunities among the DWH Trustees, public participation, and the administrative record. The Trustee Council SOP is available online through the NOAA Restoration Portal at

<http://www.gulfspillrestoration.noaa.gov/> (Trustee Council 2016). The Trustee Council SOP was developed and approved by consensus of the Trustee Council and may be amended as needed. The division of responsibilities among the Trustee Council, TIGs, and individual trustee agencies is summarized in Table 7.2-1 of the Final PDARP/PEIS (DWH Trustees 2016).

1.3.4 Final PDARP/PEIS Record of Decision

Given the potential magnitude and breadth of restoration for injuries resulting from the DWH Oil Spill, the DWH Trustees prepared a PDARP/PEIS under OPA and NEPA to analyze alternative approaches to implementing restoration and guiding restoration decisions. Based on the DWH Trustees' thorough assessment of impacts to the Gulf of Mexico's natural resources, a comprehensive, integrated ecosystem restoration approach for restoration implementation was proposed. On February 19, 2016, the DWH Trustee Council issued a Final PDARP/PEIS detailing a specific proposed plan to fund and implement restoration projects across the Gulf of Mexico region over the next 15 years. On March 29, 2016, in accordance with OPA and NEPA, the DWH Trustees published a Notice of Availability of a ROD for the Final PDARP/PEIS in the *Federal Register* (NOAA Fisheries 2016a). Based on the DWH Trustees' injury determination established in the Final PDARP/PEIS, the ROD set forth the basis for the DWH Trustees' decision to select Alternative A: Comprehensive Integrated Ecosystem Alternative. The DWH Trustees' selection of Alternative A includes the funding allocations established in the Final PDARP/PEIS. More information about Alternative A can be found in Sections 5.5 and 5.10 of the Final PDARP/PEIS (DWH Trustees 2016).

1.3.5 Relationship of the Draft RP/EA to the Final PDARP/PEIS

As a programmatic restoration plan, the Final PDARP/PEIS provides direction and guidance for identifying, evaluating, and selecting future restoration projects to be carried out by the TIGs (DWH Trustees 2016:Section 5.10.4 and Chapter 7). The DWH Trustees elected to prepare a PEIS to support analysis of the environmental consequences of the selected restoration types, to consider the multiple related actions that may occur because of restoration planning efforts, and to allow for a better analysis of cumulative impacts of potential actions. The programmatic approach was taken to assist the TIGs in their development and evaluation and to assist the public in its review of future restoration projects. The Final PDARP/PEIS was also developed to support a tiered analysis and decision-making with the anticipation that certain future restoration actions could be undertaken without additional NEPA review, whereas others might proceed based on more focused tiered EAs or EISs. The programmatic approach was taken to assist the DWH Trustees in their development and evaluation of future restoration projects and to assist the public in its review of future restoration projects.

For the Final PDARP/PEIS, the DWH Trustees developed a set of restoration types for inclusion in programmatic alternatives, consistent with the desire to seek a diverse set of projects providing benefits to a broad array of injured natural resources and services. Ultimately, this process resulted in the inclusion of 13 restoration types in five major restoration goals (restore and conserve habitat; restore water quality; replenish and protect living coastal and marine resources; provide and enhance recreational opportunities; and provide for monitoring, adaptive management, and administrative oversight to support restoration implementation) (DWH Trustees 2016):

1. Wetlands, Coastal, and Nearshore Habitats
2. Habitat Projects on Federally Managed Lands
3. Nutrient Reduction (Nonpoint Source)
4. Water Quality (e.g., Stormwater Treatments, Hydrologic Restoration, Reduction of Sedimentation, etc.)

5. Fish and Water Column Invertebrates
6. Sturgeon
7. Submerged Aquatic Vegetation
8. Oysters
9. Sea Turtles
10. Marine Mammals
11. Birds
12. Mesophotic and Deep Benthic Communities
13. Provide and Enhance Recreational Opportunities

As mentioned briefly above, the Final PDARP/PEIS was intended to be used to tier the NEPA analysis in the subsequent restoration plans prepared by the TIGs (40 CFR 1502.20; DWH Trustees 2016:Chapter 6). A tiered environmental analysis is a project-specific analysis that focuses on project-specific issues and summarizes or references (rather than repeats) the broader issues discussed in the Final PDARP/PEIS. This RP/EA is consistent with the Final PDARP/PEIS and ROD and provides a NEPA analysis for each alternative, tiering from the Final PDARP/PEIS where applicable. For this RP/EA, the DWH Trustees considered the extent to which additional NEPA analyses may be necessary for the alternatives that tier their NEPA analyses from the Final PDARP/PEIS. These considerations include whether the analyses of relevant conditions and environmental effects described in the Final PDARP/PEIS are still valid and whether impacts under the alternatives have already been fully analyzed in the Final PDARP/PEIS. The applicable sections of the Final PDARP/PEIS are incorporated by reference into this plan (40 CFR 1502.21).

Section 2 of this RP/EA summarizes the screening process used to develop a reasonable range of alternatives, which is consistent with the DWH Trustees' selected programmatic alternative in the Final PDARP/PEIS, the Consent Decree, and OPA. The LA TIG also prepared a NEPA environmental consequences analysis for the reasonable range of alternatives in this RP/EA (see Section 4), which tiers from the Final PDARP/PEIS programmatic NEPA analysis. The LA TIG used the direction and the guidance of the Final PDARP/PEIS to consider and evaluate alternatives within the Nutrient Reduction (Nonpoint Source) restoration type and the Provide and Enhance Recreational Opportunities restoration type.

Chapter 5 of the Final PDARP/PEIS analyzes different restoration approaches to address resource injuries for each restoration type. The alternatives evaluated in this RP/EA are consistent with the restoration approaches described in the PDARP/PEIS for the Nutrient Reduction (Nonpoint Source) restoration type and the Provide and Enhance Recreational Opportunities restoration type.

1.3.5.1 NUTRIENT REDUCTION (NONPOINT SOURCE) RESTORATION TYPE

The Nutrient Reduction (Nonpoint Source) restoration type is described in Section 5.5.4.2 of the Final PDARP/PEIS (DWH Trustees 2016). Of the four restoration approaches identified in the Final PDARP/PEIS, the following approach is addressed in this RP/EA:

- **Reduce nutrient loads to coastal watersheds.** This restoration approach would implement agricultural conservation practices (CPs) in vulnerable areas to reduce nutrient pollution through voluntary conservation programs. In coordination with USDA Natural Resources Conservation Service (NRCS), landowners can improve nutrient application and management methods to decrease the amount of nutrients going into the watershed and ultimately discharging into coastal Gulf of Mexico waters.

1.3.5.2 PROVIDE AND ENHANCE RECREATIONAL OPPORTUNITIES RESTORATION TYPE

The Provide and Enhance Recreational Opportunities restoration type is described in Section 5.5.14.2 of the Final PDARP/PEIS (DWH Trustees 2016). Of the nine restoration approaches identified in the PDARP/PEIS, the following approaches are addressed in this RP/EA:

- **Enhance public access to natural resources for recreational use.** This restoration approach focuses on creating new or improved access to natural resources for recreational purposes by enhancing existing or constructing new infrastructure. Providing or improving water access in publicly owned areas through the construction and operation of boat ramps, piers, or other infrastructure could also improve public access. Larger-scale infrastructure improvements such as the construction or improvement of roads and bridges could also serve to improve access to natural resources. Enhancing public access would also include targeted acquisition of land parcels to serve as public access points.
- **Enhance recreational experiences.** This restoration approach focuses on enhancing the public's recreational experiences. The quality of activities such as swimming, boating, diving, bird watching, beach going, camping, and fishing can vary depending on the appearance and functional condition of the surrounding environment in which they occur. A variety of restoration techniques could be used individually or in combination as potential restoration projects.
- **Promote environmental stewardship, education, and outreach.** This restoration approach involves providing and enhancing recreational opportunities through environmental stewardship, education, and outreach activities. Multiple restoration techniques could be used individually, or in combination, as potential restoration projects.

1.3.6 Summary of Injuries Addressed in this Draft RP/EA

According to OPA regulations, injury is “An observable or measurable adverse change in a natural resource or impairment of a natural resource service. Injury may occur directly or indirectly to a natural resource and/or service” (15 CFR 990.30). Types of injuries can include adverse changes in survival, growth, and reproduction; in health, physiology, and biological condition; in behavior; in community composition; in ecological processes and functions; in physical and chemical habitat quality or structure; and in public services.

For the Final PDARP/PEIS, the DWH Trustees conducted an injury assessment under the authority of and in accordance with OPA regulations (33 USC 2701 et seq.; DWH Trustees 2016: Chapter 4). The injury assessment establishes the nature, degree, and extent of injuries from the DWH incident to both natural resources and the services they provide. Injury assessment results were used to inform restoration planning so that restoration would address the nature, degree, and extent of the injuries. The injury assessment provided in the Final PDARP/PEIS was used to identify restoration goals and subsequent restoration types that addresses the injuries.

A number of different resource categories were evaluated, including losses to recreational users, nearshore marine ecosystems, and water column effects. Impacts to recreational users occur when oil degrades the quality of a natural resource and impairs an individual's ability to interact with it. During the DWH Oil Spill, some beaches were closed, fishing areas and bay access were limited, recreational fishing was minimized, and camping and other recreational uses were minimized because of oiling or cleanup activities. The oil spill affected recreation in the Gulf of Mexico as a result of people cancelling recreational trips, choosing alternate sites for recreation, modifying planned activities, and experiencing a reduction in the quality of their recreational activities (DWH Trustees 2016:Section 4.10.1). Both direct oiling and the expectation of oiling caused individuals to cancel planned recreational fishing trips to coastal areas.

1.3.6.1 NUTRIENT REDUCTION

Almost all types of nearshore ecosystem habitats in the northern Gulf of Mexico were oiled and injured as a result of the DWH Oil Spill, including coastal watersheds. The Final PDARP/PEIS determines that injuries to marsh flora and fauna can persist until oil concentrations in marsh soils fall below levels that are toxic to the most sensitive prey species and life stages (DWH Trustees 2016:Section 4.6). Populations of long-lived species (e.g., periwinkle snails, sturgeon) take years to recover normal age and size distributions, even after environmental conditions are no longer toxic. The largest patches of submerged aquatic vegetation (SAV), which spread slowly through rhizomes, can also take decades to recover (DWH Trustees 2016:Chapter 4.6).

Addressing injuries to these nearshore ecosystem habitats requires special attention. Gulf salt marshes are productive because of their intricate complexity. Sinuous tidal channels that maximize edge habitat provide fauna access to flooded marsh surfaces for refuge and forage and promote rapid growth of juvenile fish and invertebrates of commercial importance (DWH Trustees 2016: Section 4.6). Nutrient reduction assists in addressing these injuries by benefitting the estuaries that are integral habitats providing food, shelter, and nursery grounds for many of the Gulf of Mexico's ecologically and economically important species (e.g., fish).

Nutrient pollution poses a significant threat to localized watersheds across the entire Gulf Coast and in Louisiana. Excessive nutrient enrichment, or eutrophication, of Gulf Coast estuaries and their watersheds is a chronic threat that can lead to hypoxia (low oxygen levels), harmful algal blooms, habitat losses, and fish kills. The DWH incident resulted in impacts to water quality. Reducing nutrient loading helps to address the chronic and pervasive ecosystem threats incurred by eutrophic Gulf Coast waters (DWH Trustees 2016:Section 5.5.4).

Under the goal of restore water quality, the DWH Trustees identified the restoration type Nutrient Reduction (Nonpoint Source) because they recognized that addressing nutrient pollution contributes to the overall health and resiliency of coastal ecosystems, which also benefits recreational uses.

Nutrient reduction can enhance overall ecosystem health by benefitting the estuaries that are integral habitats providing food, shelter, and nursery grounds for many of the Gulf of Mexico's ecologically and economically important species (e.g., fish). Nutrient reduction involves a suite of activities to reduce nutrient loadings, depending on the watershed and site characteristics. Agriculture and its associated land use practices (e.g., application of fertilizer and concentrated animal farm operations) is a principal source of elevated nutrient loads along the Gulf Coast, and in the state of Louisiana, agriculture accounts for approximately 38% of the land use (USDA 2017). Implementation of a variety of CPs could reduce nutrient concentrations from agricultural lands along Louisiana's coastal watersheds.

1.3.6.2 RECREATIONAL USE

Impacts to recreational users occur when either oil degrades the quality of a natural resource or activities associated with spill response impair an individual's opportunity, ability, or desire to interact with natural resources. During the DWH Oil Spill, some beaches were closed, fishing areas and bay access were limited, recreational fishing was curtailed, and camping and other recreational uses were diminished because of oiling or cleanup activities. The DWH Oil Spill affected recreation in the Gulf of Mexico as a result of people cancelling recreational trips, choosing alternate sites for recreation, modifying planned activities, and experiencing a reduction in the quality of their recreational activities (DWH Trustees 2016:Section 4.10.1). Both direct oiling and the expectation of oiling caused individuals to cancel planned recreational fishing trips to coastal areas.

The DWH injury assessment of lost recreational use covered two broad categories of recreation: shoreline use and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas and includes swimming, sunbathing, surfing, walking, camping, kayaking, and fishing from the shore or shoreline structures (i.e., piers). It also includes fishing at sites that are considered coastal but are not directly on the beach. Specifically excluded from the shoreline use assessment are recreational boating, commercial activities, and oil spill response.

The second broad category, boating, includes individuals engaged in recreational boating activities that begin at sites providing access to salt water near the Gulf Coast. The term “sites” encompasses a wide variety of locations providing boat access to coastal waters, including marinas, unimproved launches, and private residences. Excluded from this category are non-recreational boating activities, including commercial fishing, law enforcement/safety, and oil spill response.

1.4 Restoration Purpose and Need

The LA TIG has undertaken this nutrient reduction and recreational use restoration planning effort to meet the purpose of contributing to the compensation for and restoration of natural resources and services injured in the Louisiana Restoration Area as a result of the DWH Oil Spill. This RP/EA falls within the scope of the purpose and need identified in the Final PDARP/PEIS. As described in Section 5.3 of the Final PDARP/PEIS, the five DWH Trustee programmatic restoration goals work independently and together to benefit injured resources and services. This RP/EA focuses on the restoration of injuries to Louisiana’s natural resources and services, with two specific restoration types: 1) Nutrient Reduction (Nonpoint Source) and 2) Provide and Enhance Recreational Opportunities.

Nutrient Reduction (Nonpoint Source) restoration type. For the purpose of restoring natural resources and services injured as a result of the DWH Oil Spill, the DWH Trustees need to address the nutrient loadings to Gulf Coast estuaries, habitats, and resources in Louisiana. The quality of Gulf Coast water is closely linked to human activities (e.g., development, industry, and agriculture) within watershed (or basin) boundaries and is closely related to other DWH Trustee–stated goals including replenishing and protecting living coastal and marine resources. The Final PDARP/PEIS acknowledges that resources such as fish, sea turtles, and deep benthic communities make up an interconnected Gulf of Mexico food web and important ecosystem services, such as contributing to a resilient, biologically diverse, and productive system better capable of rebounding from natural events and pressures as well as anthropogenic events and pressures (Adger et al. 2005, as cited in DWH Trustees 2016:Section 5.3.1).

Louisiana Trustees have identified nutrient-laden runoff from agricultural lands as a principal source of water quality degradation in coastal Louisiana watersheds. Given this, they have identified nutrient reduction alternatives aimed at restoring coastal environments and resources through CPs on agricultural lands. These alternatives are intended to target efforts by clustering projects at the hydrologic unit code (HUC) 12 watershed scale to benefit the coastal environment and associated habitats. Alternatives were grouped by HUC 12 watersheds to achieve measurable impacts. The eight project alternatives within the Nutrient Reduction (Nonpoint Source) restoration type evaluated in this RP/EA fall into one of the following themes:

- Theme 1: Nutrient Reduction on Dairy Farms
- Theme 2: Nutrient Reduction on Cropland and Grazing Land
- Theme 3: Winter Water Holding on Cropland

Provide and Enhance Recreational Opportunities restoration type. For the purpose of restoring natural resources and services injured as a result of the DWH Oil Spill, the DWH Trustees need to address the associated recreational loss that occurred in Louisiana. The DWH Trustees propose to implement compensatory restoration projects that would provide the public with additional and enhanced recreational use services in Louisiana in a manner consistent with the Final PDARP/PEIS.

Louisiana Trustees have identified lost recreational opportunities, such as fishing, camping, hunting, boating, and hiking, as the most significantly impacted recreational use in the state. The lost recreational opportunities occurred statewide because people in non-coastal areas cancelled trips to the coast during closures related to the DWH Oil Spill. Given these widespread impacts of the spill, Louisiana's approach to restoring lost recreational use in this RP/EA is multi-faceted and uses a combination of many of the recreational use restoration approaches described in the Final PDARP/PEIS, including enhancing public access to natural resources for recreational use; enhancing recreational experiences; and promoting environmental stewardship, education, and outreach. These approaches are used within all 23 of the recreation alternatives evaluated in this RP/EA, including the creation of new or enhancement of existing recreational infrastructure, enhanced recreational access and opportunities, and the development of educational and outreach components to promote responsible use of natural resources.

1.5 Proposed Action: The Draft Restoration Plan and Environmental Assessment

To address the Trustee programmatic and restoration type goals described in the Final PDARP/PEIS, the LA TIG proposes to undertake the planning and implementation of the 23 projects identified as preferred alternatives in this RP/EA to provide nutrient reduction benefits to the coastal environment and associated habitats (four preferred alternatives) and to restore lost recreational use (19 preferred alternatives) in Louisiana using funds made available through the DWH Consent Decree. A detailed description of each of the alternatives considered in this RP/EA is provided in Section 3.

1.6 Alternatives Considered in the Restoration Plan and Environmental Assessment

In total, the LA TIG evaluated 31 different projects and a No Action Alternative as the reasonable range of alternatives in this RP/EA. These projects are intended to contribute to nutrient reduction and the restoration of lost recreational use in the Louisiana Restoration Area. Through the alternative evaluation process described in the remainder of this document, the LA TIG selected 23 projects as preferred alternatives. Tables 1.6-1 and 1.6-2 identify the alternatives evaluated and which of those alternatives are preferred for implementation. The locations of the reasonable range of alternatives are shown on Figure 1.7-1.

Table 1.6-1. Nutrient Reduction Alternatives

Alternative Name	Location (Parish)	Summary	Preferred Alternative
Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes	St. Helena and Tangipahoa	Implement program to reduce nutrients and fecal coliform bacteria runoff from dairy operations from entering water bodies through nutrient management planning and implementation of best management practices (BMPs) and CPs.	Yes
Nutrient Reduction on Dairy Farms in Washington Parish	Washington	Implement program to reduce nutrients and fecal coliform bacteria runoff from dairy operations from entering water bodies through nutrient management planning and implementation of BMPs and CPs.	Yes
Nutrient Reduction on Cropland and Grazing Land in Bayou Folse	Lafourche and Terrebonne	Implement nutrient management strategy to protect and restore aquatic ecosystems. The primary goal for the nutrient reduction alternative is water quality improvement through nutrient reduction.	Yes
Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes	Concordia, Catahoula, and Tensas	Implement nutrient management strategy to protect aquatic ecosystems. The primary goal for the nutrient reduction alternative is water quality improvement through nutrient reduction.	No
Nutrient Reduction on Cropland and Grazing Land in Iberia, St. Mary, and Vermilion Parishes	Iberia, St. Mary, and Vermilion	Implement nutrient management strategy to protect and restore aquatic ecosystems. The primary goal for the nutrient reduction alternative is water quality improvement through nutrient reduction.	No
Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices	Vermilion and Cameron	Implement nutrient management strategy through the retention of irrigation water over the fall and winter for the purpose of improving water quality and creating wildlife habitat. Winter water holding allows for sediment deposition, nutrient uptake by emergent aquatic vegetation, use of the previous planting year's crop residue to reduce soil disturbance from wind-induced water movement and from animal feeding activity.	Yes
Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes	St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis	Implement nutrient management strategy through the retention of irrigation water over the fall and winter for the purpose of improving water quality and creating wildlife habitat. Winter water holding allows for sediment deposition, nutrient uptake by emergent aquatic vegetation, use of the previous planting year's crop residue to reduce soil disturbance from wind-induced water movement and from animal feeding activity.	No
Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes	Concordia, Tensas, and Catahoula	Implement nutrient management strategy through the retention of irrigation water over the fall and winter for the purpose of improving water quality and creating wildlife habitat. Winter water holding allows for sediment deposition, nutrient uptake by emergent aquatic vegetation, use of the previous planting year's crop residue to reduce soil disturbance from wind-induced water movement and from animal feeding activity.	No

Table 1.6-2. Recreational Use Alternatives

Alternative Name	Location (Parish)	Summary	Preferred Alternative
Pass-a-Loutre Wildlife Management Area Crevasse Access	Plaquemines	Improve boater access with crevasse clean out at five locations in various management area water bodies.	Yes
Pass-a-Loutre Wildlife Management Area Campgrounds	Plaquemines	Install new picnic tables, fire pit/barbeque areas, and docks at five campgrounds.	Yes
Grand Isle State Park Improvements	Jefferson	Upgrade and expand existing pier to include lighting, Americans with Disabilities Act (ADA) fishing rail sections, benches, shaded structure area(s) and a fish cleaning station; upgrade existing rock jetties at Grand Isle State Park and Grand Isle West property; repair and upgrade existing limestone and wooden boardwalk; and repair trails on existing asphalt roads.	Yes
Chitimacha Boat Launch	St. Mary	Construct a new boat launch on Bayou Teche, an access road, parking areas for boats and trailers, pavilions, floating and wooden docks, and pedestrian trails.	Yes
Sam Houston Jones State Park Improvements	Calcasieu	Replace 10 existing trailer cabins with State Park standard cabins that would be pier and beam or slab on grade; construct new restroom/comfort station, renovate existing day-user restrooms and cabins.	Yes
Pointe-aux-Chenes Wildlife Management Area Recreational Use Enhancement	Terrebonne	Provide access improvements, construct boat docks, fishing piers and walkways at water control structures, small vessel (kayak, pirogue, etc.) launch, and pirogue pullovers.	Yes
WHARF Phase 1	Jefferson	Construct boardwalk for fishing/fishing piers, restroom facilities, activity centers, and lighting to provide fishing access to borrow pits on either side of the retired airstrip.	Yes
Bayou Segnette State Park Improvements	Jefferson	Upgrade boating areas including: raising the elevation of the parking area, improving the launch lanes and docks, and installing new floating dock; replace two small day-use restrooms with ADA-compliant facilities; replace surfacing at all four playgrounds; repair and upgrade existing roads and parking areas; repair and upgrade bridge approaches.	Yes
Atchafalaya Delta Wildlife Management Area Access	St. Mary	Bucket dredge Breaux Pass and the Cul-de-sac Passes to enhance currently limited access for hunters and anglers to interior marsh.	Yes
Atchafalaya Delta Wildlife Management Area Campgrounds	St. Mary	Construct a steel bulkhead following the entire shoreline of the campground and construct two jetties for bank stabilization.	Yes
Rockefeller Piers and Rockefeller Signage	Cameron	Create new recreation and observation piers for birding, fishing, and crabbing opportunities and signage for informational outreach to recreational users of the Rockefeller Wildlife Refuge.	Yes
St. Bernard State Park Improvements	St. Bernard	Renovate park entrance station, restroom and bathhouse facilities, and event pavilion.	Yes
Cypremort Point State Park Improvements	St. Mary	Reinforce rock jetties, replace breakwater system, perform beach reclamation, replace fishing pier, and provide improvements to roads and parking areas.	Yes
The Wetlands Center	Jefferson	Construct an educational and cultural venue adjacent to the existing museum, theatre, library, and community center with wetlands exhibits (multi-media interactive storytelling, permanent and changing exhibits, hands-on experiential learning activities, historical and cultural artifacts, aquarium tanks, exterior wildlife tanks, 3-D interactive maps, and habitat models).	Yes

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Nutrient Reduction (Nonpoint Source) and Recreational Use*

Alternative Name	Location (Parish)	Summary	Preferred Alternative
Recreational Use Improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit	Jefferson	Provide engineering, design, and construction of trails and wayside exhibits at Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit.	Yes
Des Allemands Boat Launch	St. Charles	Construct a new boat launch facility and associated boat/trailer parking, car parking, and docks.	Yes
Middle Pearl	St. Tammany	Improve existing boat launch and parking, and install mooring docks and lighting.	Yes
Improvements to Grand Avouille Boat Launch	St. Mary	Construct new concrete boat ramp and apron with timber mooring docks along each side of boat ramp and parking for boats and trailers and cars.	Yes
Belle Chasse	Plaquemines	Construct a new back-down boat ramp and parking facility on Hero Canal.	Yes
Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin	Jefferson	Construct additional parking at each end of existing piers, two 15 x 20-foot-wide shelters on each of the piers (four total), a building at the landing of each of the fishing piers to accommodate two ADA-accessible bathroom facilities, and an overhang to provide for a fish cleaning area.	No
Palmetto Island State Park Improvements	Vermilion	Construct five cabins and a large event pavilion, repair and improve nature trails, install bear proof dumpsters, replace heating, ventilation, and air conditioning (HVAC) system.	No
Louisiana Swamp Exhibit at Audubon Zoo	Orleans	Revitalize and refocus the Louisiana Swamp interpretive exhibit at the Audubon Zoo to share the story of the Louisiana coast, directed at encouraging action to preserve and restore coastal Louisiana; exhibit would provide an entirely immersive Louisiana coastal experience.	No
Louisiana Wetlands Gallery at Audubon Aquarium	Orleans	Create a new gallery at the aquarium focused on Louisiana's coast, transforming the 7,450-square-foot Mississippi River Gallery into a Louisiana Wetlands Gallery detailing biodiversity and the fragile and threatened state of Louisiana's coast with live animal exhibits and hands-on, interactive educational experiences.	No

The preferred alternatives for recreational use total approximately \$38 million, which represents the remaining funds allocated to Louisiana for the Provide and Enhance Recreational Opportunities restoration type. Therefore, it is anticipated that after the TIG's decision associated with this RP/EA, no additional funds for recreational use restoration planning would be available.

The preferred alternatives for nutrient reduction total \$9.5 million. Therefore, nutrient reduction alternatives not proposed as preferred in this Draft RP/EA could be considered as part of future restoration planning because \$10.5 million remaining funds for the Nutrient Reduction (Nonpoint Source) restoration type would be available.

1.8 Relationship to Other Plans, Policy, or Actions

1.8.1 Previous Restoration under DWH Restoration Planning

Because of to the magnitude of the DWH Oil Spill, the DWH Trustees began planning for and implementing Early Restoration projects with funding from BP before the oil spill's injury assessment was complete and before the entry of the Consent Decree. Early Restoration occurred in five separate phases, during which Early Restoration plans were prepared and associated NEPA compliance was completed. These actions are a subset of the extensive, continuing effort needed to address complete restoration of injuries to natural resources resulting from the DWH Oil Spill.

During Early Restoration, in June 2014, the DWH Trustees issued the *Final Programmatic and Phase III Early Restoration Plan and Programmatic Environmental Impact Statement* (Phase III ERP/PEIS), selecting, among a variety of other projects, the Louisiana Marine Fisheries Enhancement, Research, and Science Center (LMFERSC) (DWH Trustees 2014:Chapter 9, Section 9.8). Site issues that arose during planning and development of the LMFERSC precluded the LA TIG from moving forward with the project as initially proposed.

To date, the LA TIG has released three restoration plans to the public:

- *LA TIG Final Restoration Plan #1: Restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; and Birds*, which selects six restoration alternatives for E&D: two bird island projects (Queen Bess and Rabbit Island Restoration), three coastal wetlands projects (Terrebonne Basin Ridge and Marsh Creation Project: Bayou Terrebonne Increment; Barataria Basin Ridge and Marsh Creation Project: Spanish Pass Increment; and Lake Borgne Marsh Creation Project: Increment One), and one habitat project on federally managed lands (Shoreline Protection and Jean Lafitte National Park and Preserve) (LA TIG 2017a).
- *Louisiana Trustee Implementation Group Draft Restoration Plan/Environmental Assessment #2: Provide and Enhance Recreational Opportunities*, which as described above, proposes to reallocate the Early Restoration funds earmarked for LMFERSC to four projects intended to provide and enhance recreational use (LA TIG 2017b).
- *LA TIG Strategic Restoration Plan and Environmental Assessment #3: Restoration of Wetlands, Coastal, and Nearshore Habitats in Barataria Basin, Louisiana* was prepared to identify a restoration strategy that will help prioritize future decisions regarding project selection and funding in Barataria Basin, Louisiana (LA TIG 2017c).

1.8.2 Coordination with Other Gulf Restoration Programs

As discussed in Section 1.5.6 of the Final PDARP/PEIS, the LA TIG is committed to coordination with other Gulf of Mexico restoration programs to maximize the overall ecosystem impact of DWH NRDA restoration efforts. This coordination will ensure that funds are allocated for critical restoration projects across the affected regions of the Gulf of Mexico and within Louisiana.

During the restoration planning process, the LA TIG has coordinated and will continue to coordinate with other DWH Oil Spill and Gulf of Mexico restoration programs, including the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States (RESTORE) programs and the National Fish and Wildlife Foundation Gulf Environmental Benefit Fund. In doing so, the LA TIG has reviewed the implementation of projects in other coastal restoration programs and is striving to develop synergies with those programs to ensure the most effective use of available funds for the maximum coastal benefit.

1.9 Public Participation

The LA TIG issued a notice of solicitation to the public on July 14, 2017, to request submission of project ideas through August 14, 2017. Projects were considered and evaluated. On October 2, 2017, the LA TIG issued a notice of intent (NOI) informing the public that it was initiating the drafting of a restoration plan to address nutrient reduction (nonpoint source) and lost recreational opportunities caused by the DWH Oil Spill.

1.9.1 Comment Period and Public Meeting Information

The public is encouraged to review and comment on this RP/EA. Following public notice, this RP/EA will be available to the public for a 30-day comment period. The deadline for submitting written comments on this RP/EA is specified in the public notice published in the *Federal Register* and on the NOAA Gulf Spill web portal. Comments must be postmarked no later than 30 days after the start of the comment period. Comments on this RP/EA can be submitted during the comment period by one of following methods:

Online: <http://www.gulfspillrestoration.noaa.gov/restoration-areas/louisiana>

By mail (hard copy), addressed to the following:

U.S. Fish and Wildlife Service
P.O. Box 49567
Atlanta, Georgia 30345

Please note that personal identifying information included in submitted comments (e.g., address, telephone number, email address, etc.) may be made publicly available.

In person:

The LA TIG will hold a public meeting to facilitate the public review and comment process. Meeting date, time, and location are noted below.

Date: April 24, 2018

Time: Open house at 5:30 p.m., meeting begins at 6:00 p.m.

Location: Tulane River and Coastal Center; 1370 Port of New Orleans Place; New Orleans, Louisiana 70130

After the comment period closes, the LA TIG will consider all comments received and will revise this RP/EA as appropriate. A summary of comments received and the LA TIG's responses where applicable will be included in the Final RP/EA.

1.9.2 Decision to be Made

The intent of this RP/EA is to provide the public and decision makers with the information and analysis needed to enable meaningful review and comment on the LA TIG's proposal to proceed with the selection and implementation of one or more of the alternatives proposed in this plan. Projects not identified for inclusion in the Final RP/EA may be considered for inclusion in future restoration plans.

1.9.3 Administrative Record

The DWH Trustees opened a publicly available administrative record for the NRDA for the DWH Oil Spill, including restoration planning activities, concurrently with publication of the 2010 NOI (pursuant to 15 CFR 990.45). DOI is the federal trustee that maintains the administrative record, which can be found online at <http://www.doi.gov/deepwaterhorizon/adminrecord>. This administrative record site is also used by the LA TIG for DWH restoration planning.

Information about restoration project implementation is provided to the public through the administrative record and other outreach efforts, including online at <http://www.gulfspillrestoration.noaa.gov>.

1.10 Document Organization

This section describes the organization of this RP/EA, which consists of Sections 1 through 10 and five appendices.

- Section 1 (Introduction): Introductory information and context for this RP/EA, background on the NRDA restoration planning process, summary of injuries to resources resulting from the DWH Oil Spill addressed in this RP/EA, and screening of alternatives to address those injuries
- Section 2 (Restoration Planning Process): Identification and evaluation of alternatives for compensating the public for the effects to water quality in coastal watersheds (nutrient reduction) and lost recreational use
- Section 3 (Oil Pollution Act Evaluation of Alternatives): Evaluation of the reasonable range of alternatives proposed for NRDA restoration against criteria set forth in OPA, and proposal of a suite of preferred restoration alternatives
- Section 4 (Environmental Assessment): Description of the affected environment and the environmental consequences for each of the reasonable range of alternatives evaluated in this RP/EA
- Section 5 (Cumulative Impacts): Description of the cumulative impacts of the alternatives when added to other past, present, and reasonably foreseeable future actions
- Section 6 (Compliance with Other Laws and Regulations): Identification and description of other federal and state laws, in addition to the requirements of OPA and NEPA, that may apply to the preferred alternatives in this RP/EA
- Section 7 (Response to Public Comment): Review of public comments received on this RP/EA
- Section 8 (List of Preparers and Reviewers): Identification of individuals who substantively contributed to the development of this RP/EA

- Section 9 (List of Repositories): A list of facilities that received copies of this RP/EA for review by the public
- Section 10 (Literature Cited): A list of references used to write and support the analysis in this RP/EA
- Appendix A (Supplemental Affected Environment Details and *Deepwater Horizon Oil Spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement* Impact Determination Definitions): Additional information related to resources described in the Affected Environment section of this RP/EA and impact determination definitions excerpted from the Final PDARP/PEIS
- Appendix B (Project Universe): A comprehensive list of project alternatives screened and evaluated, as described in detail in Section 2
- Appendix C (Monitoring and Adaptive Management Plans): One plan developed for each of the preferred alternatives
- Appendix D (Conservation Practices, Natural Resources Conservation Service Environmental Evaluation Worksheet, and Exemplar Conservation Practice Network Diagrams): Supplemental information related to the nutrient reduction alternatives, which includes 1) a comprehensive list of CPs that could be implemented under the alternatives, 2) the NRCS Environmental Evaluation Worksheet used for analyzing site-specific environmental impacts from CPs, and 3) CP network diagrams showing potential environmental effects from representative CPs
- Appendix E (Alternative Figures): Additional figures that support the description of various alternatives provided in Section 3

2 RESTORATION PLANNING PROCESS

2.1 Project Screening and Alternatives

The restoration planning process started prior to the DWH Oil Spill settlement with BP and issuance of the Final PDARP/PEIS, and this RP/EA represents a continuation of that restoration planning process. Previous steps taken in this process included assessing the injury from the DWH Oil Spill, developing restoration projects as part of the Early Restoration program undertaken jointly by the DWH Trustees and BP, and planning for programmatic restoration as part of the Final PDARP/PEIS (DWH Trustees 2016). Upon completion of the settlement with BP, the DWH Trustees created the LA TIG to implement comprehensive DWH restoration planning in Louisiana.

One focus of this RP/EA is implementation of the Final PDARP/PEIS restoration type Nutrient Reduction (Nonpoint Source), which is intended to reduce nutrient pollution and provide ecosystem-scale benefits to coastal habitats and resources chronically threatened by nutrients and co-pollutants causing water quality degradation. Excess nutrient inputs to Louisiana's coastal estuaries are associated with harmful algal blooms and oxygen depleted waters, i.e., hypoxic zones. Algal blooms and hypoxic zones in turn negatively impact the spawning habitats and food sources on which the region's economically valuable fisheries rely (Mississippi River/Gulf of Mexico Watershed Nutrient Task Force 2015).

Another focus of this RP/EA is to Provide and Enhance Recreational Opportunities. Louisiana suffered significant recreational use loss resulting from the DWH Oil Spill, including restricted and decreased access to recreational fishing opportunities, recreational camping activities, and outdoor recreational activities. Impacts from the DWH Oil Spill, including oiled shorelines, the closure of fishing and recreational areas, and the cancellation of recreational trips. This resulted in losses to the public's use of natural resources for outdoor recreation, including fishing, boating, vacationing, camping, beach going, and other recreational activities. These impacts affected the entire state of Louisiana.

This RP/EA tiers from the Final PDARP/PEIS, and the process outlined in this RP/EA is consistent with the goal of implementing nutrient reduction projects and providing and enhancing recreational opportunities. This section provides a discussion of the screening process used to develop the reasonable range of alternatives in this RP/EA. Additional information regarding the Final PDARP/PEIS and ROD, the relationship of this RP/EA to the Final PDARP/PEIS, and a summary of the injuries addressed in this RP/EA are in Section 1.3.6.

2.2 Screening for Reasonable Range of Alternatives

The goal of the LA TIG's screening process was to identify a reasonable range of alternatives suitable for addressing injuries to natural resources and their services in Louisiana caused by the DWH Oil Spill. The screening process identifies alternatives that improve and reduce nutrient pollution to habitats and resources and provide and enhance recreational opportunities. The screening process also considered the alternatives' ability to meet the OPA criteria with no major negative environmental impacts under NEPA.

Screening for both nutrient reduction and recreational use alternatives was completed in a stepwise process, as shown in Figure 2.2-1. After receiving project submittals via the public portal and various state and federal Trustees, the LA TIG first conducted a general eligibility screening (Step 1). This screening was similar for both nutrient reduction and recreational use projects, with slight variations (as discussed in the following sections). Most importantly, the LA TIG accepted project alternatives during Step 1 that were 1) geographically located in the Louisiana Restoration Area, and that 2) met the goals outlined in the Final PDARP/PEIS for each restoration type. Project alternatives submitted that did not meet the eligibility criteria were screened out and received no further consideration. Similarly, project alternatives that had previously been identified for funding, received other funding from, or were appropriately considered by another TIG, and/or were more clearly aligned with other restoration types were also screened out and received no further consideration. Duplicate projects and projects with similar elements and/or geographical locations were identified and combined into single alternatives.

Project alternatives that were considered eligible after the initial screening were next evaluated by the LA TIG based on individual project merit (Step 2), then on the project alternative's ability to meet the OPA criteria (Step 3). The project alternatives that progressed through Steps 2 and 3 were re-evaluated and prioritized by the LA TIG. An emphasis was placed on recommending a portfolio of project alternatives that met the goals and objectives of the TIG, other governmental plans, as well as the goals and objectives of the Final PDARP/PEIS. In this last step (Step 4), the project alternatives were not only evaluated on their own merits, but in accordance with how they may be implemented as part of a suite of projects under this restoration plan. Detailed screening methodology used in each step, for each restoration type, is provided below.

2.2.1 Project Alternative Universe

To begin the screening process, the LA TIG assembled an initial list of project alternatives for the restoration types of Nutrient Reduction (Nonpoint Source) and Provide and Enhance Recreational Opportunities (i.e., the project alternative universe), which included the following sources:

- The DWH public comment portal established soon after the spill, which allowed the public to submit projects for the DWH Trustees' consideration
- A similar web-based portal created in 2015 by the State of Louisiana (Louisiana Project Portal)
- Projects submitted to the DWH Trustee or LA TIG portals by the public from July 14, 2017 through August 14, 2017, which was during the scoping period per the notice of solicitation
- Projects submitted by individual state and federal Trustees, including projects on the behalf of other non-Trustee agencies

The project alternative universe comprised 24 nutrient reduction project alternatives and 117 recreational use project alternatives that underwent screening as part of the restoration planning process. Appendix B lists the comprehensive project alternative universe for these two restoration types.

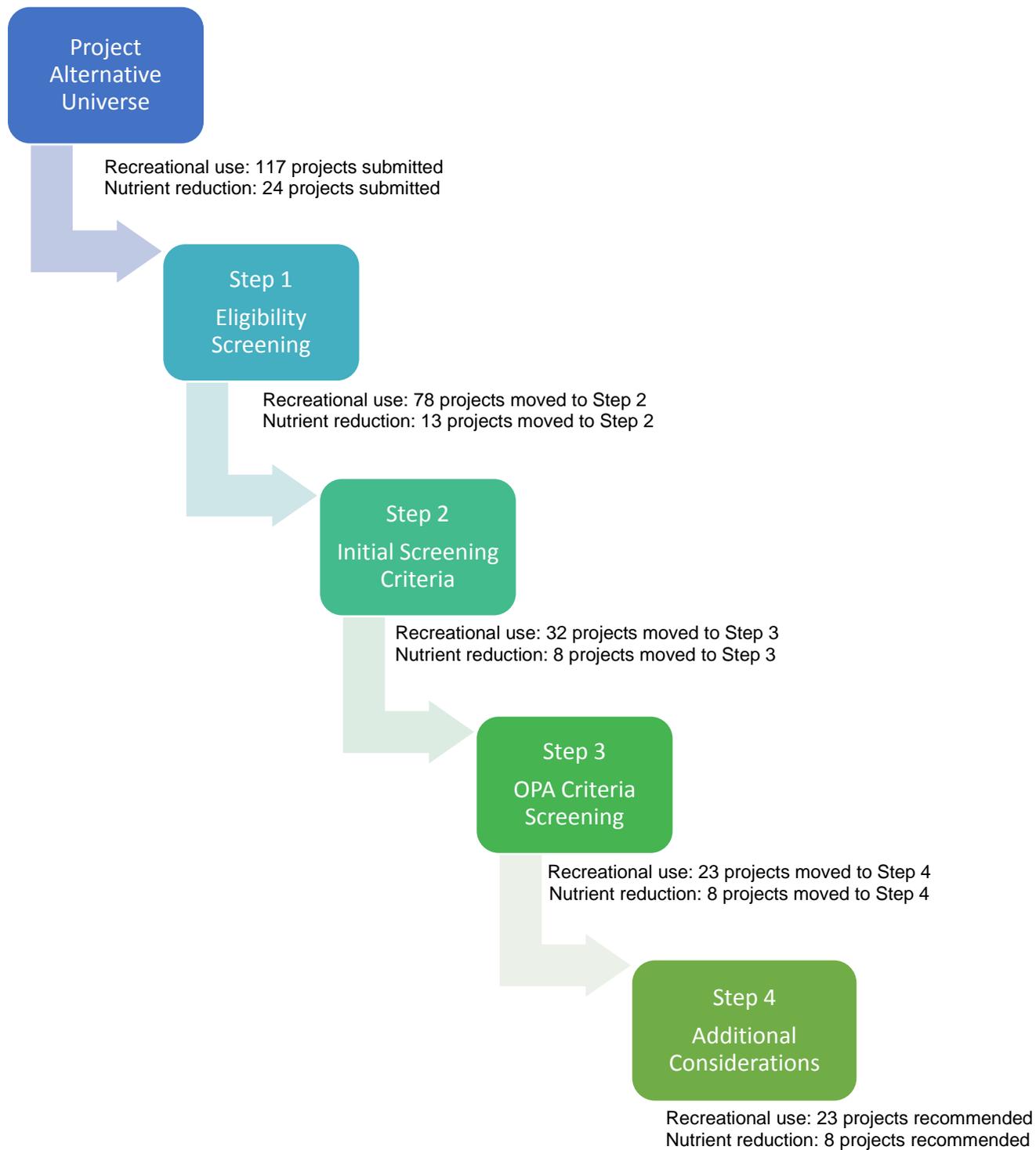


Figure 2.2-1. Graphical summary of project screening process to arrive at a reasonable range of alternatives.

2.2.2 Eligibility Screening

2.2.2.1 NUTRIENT REDUCTION (NONPOINT SOURCE)

Under the restore water quality goal in the Final PDARP/PEIS, the LA TIG focused on the Nutrient Reduction (Nonpoint Source) restoration type to improve coastal watersheds and resources. The screening process for this restoration type was designed to identify project alternatives that would reduce nutrient loading to habitats, estuaries, and natural resources within the Louisiana Restoration Area. These project alternatives could be implemented with \$20 million in DWH NRDA funds allocated to the LA TIG for this restoration type under the restore water quality goal. As outlined in Figure 2.2-1, the LA TIG used a stepwise process of screening and evaluating project alternatives for nutrient reduction. All projects submitted to the LA TIG via the public portal and by various state and federal agencies (the project alternative universe) were reviewed and screened for eligibility (Step 1) using the following criteria:

- Project alternatives must be geographically located in the Louisiana Restoration Area.
- Project alternatives must meet the goals outlined in the Final PDARP/PEIS for the Nutrient Reduction (Nonpoint Source) restoration type. Those goals are as follows:
 - Reduce nutrient loadings in coastal estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation.
 - Where appropriate, co-locate nutrient load reduction project alternatives with other restoration projects to enhance ecological services provided by other restoration approaches.
 - Enhance ecosystem services of existing and restored habitats.
- Project alternatives are more clearly aligned with the Nutrient Reduction (Nonpoint Source) restoration type and its associated goals than with another restoration type

This restoration type includes reducing nutrient loads to coastal watersheds as a restoration approach, with agricultural CPs identified as a restoration technique. The LA TIG recognizes that nutrient load reduction in upstream waterways is important to maximize improvements in coastal Louisiana watersheds. Accordingly, for the purposes of this RP/EA, the LA TIG's screening focused on the reduced nutrient loads to coastal watersheds restoration approach and agricultural management practices as restoration techniques.

Table 2.2-1 lists those project alternatives that did not move past the Step 1 screening because they were either combined with other nutrient reduction alternatives considered in this RP/EA, did not have a clear nexus to nutrient reduction, were monitoring and adaptive management projects, were more clearly aligned or appropriate for another restoration type, or did not meet the eligibility criteria listed above. Project alternatives that met all of the above criteria, and that fit within the focused restoration approach and techniques received further consideration for this restoration plan, by moving on to Step 2, Initial Screening Criteria.

Table 2.2-1. Project Alternatives that Were Combined with Similar Projects or Did Not Pass Step 1 Screening

Agency/Entity/Person	Project Name*	Reason for Removal from Consideration
USFWS	Promote public access and recreational use through hydrologic restoration of Bayou Sauvage channel, Bayou Sauvage National Wildlife Refuge	This project does not have a clear nexus to the Nutrient Reduction (Nonpoint Source) restoration type.
Environmental Defense Fund; Louisiana Wildlife Federation; National Audubon Society; National Wildlife Federation; Restore or Retreat	Violet Siphon in Central Wetlands; Maurepas Swamp Diversion; and create and enhance wetlands and coastal/riparian conservation to protect water quality and remove nutrients and pollution	These projects are more appropriate under another restoration type (Wetlands, Coastal, and Nearshore Habitats).
U.S. Geological Survey (USGS)	Characterization and trends of existing coastal Louisiana historical data on nutrient enrichment	This project is more appropriate under another restoration category (MAM).
NOAA, Southeast Fisheries Science Center; Gulf Coast Research Laboratory University of Southern Mississippi; University of New Orleans; Golden Meadow Plant Materials Center; Marine Fisheries Research Center (Texas)	Submerged aquatic vegetation enterprise	This project does not have a clear nexus to the Nutrient Reduction (Nonpoint Source) restoration type.
USGS	Flux of nutrients and sediments from the outlet of the Mississippi River to nearshore Gulf of Mexico waters	This project is more appropriate under another restoration category (MAM).
Louisiana Coastal Protection and Restoration Authority	Pilot project linking offshore to onshore water quality monitoring	This project is more appropriate under another restoration category (MAM).
Little Lagoon Preservation Society	Little Lagoon multiple site living shoreline restoration	This project is located outside of the Louisiana Restoration Area.
Partnership for Gulf Coast Land Conservation	Increase the pace, quality, and permanence of voluntary land and water conservation through the Partnership for Gulf Coast Land Conservation	This project does not have a clear nexus to the Nutrient Reduction (Nonpoint Source) restoration type.
LDEQ	Determine effectiveness of best management practices (BMPs)/CPs	This project was not carried forward as a standalone alternative; instead, aspects of the project are carried forward in the preferred alternatives.
LDEQ	Cost Share Assistance Program for Individual Sewage Repair/Replacement	This project is more appropriate under another restoration type. The LA TIG determined that sewage repair falls under the Water Quality restoration type, which is not funded in Louisiana.
LDEQ	Monitoring BMPs/CPs	This project was not carried forward as a standalone alternative; instead, aspects of the project are carried forward in the preferred alternatives.

* Project names are taken directly from the project universe and are lightly edited for clarity (see Appendix B).

2.2.2.2 PROVIDE AND ENHANCE RECREATIONAL OPPORTUNITIES

The screening process for the Provide and Enhance Recreational Opportunities restoration type was designed to identify alternatives that would provide and enhance recreational opportunities within the Louisiana Restoration Area. These project alternatives could be implemented with up to \$38 million in

DWH NRDA funds allocated to the LA TIG for recreational use restoration. As outlined in Figure 2.2-1, the LA TIG employed a stepwise process of screening and evaluating project alternatives for recreational use. All projects submitted to the LA TIG via the public portal and by various state and federal Trustees (the project alternative universe) were reviewed and screened for eligibility using the following criteria:

- Projects must be geographically located in the Louisiana Restoration Area.
- Projects must meet the goals outlined in the Final PDARP/PEIS to provide and enhance recreational opportunities. Those goals are as follows:
 - Increase recreational opportunities such as fishing, beach going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.
 - Use education and outreach to promote engagement in restoration and stewardship of natural resources, which could include education programs, social media, and print materials.
- Projects must be accessible to the public.

Project alternatives not meeting the above criteria were screened out and received no further consideration in this RP/EA. Additionally, duplicate projects and projects with similar elements and/or geographical locations were identified and combined (Table 2.2-2). Finally, projects that were already considered for funding in the LA TIG’s second RP/EA (Table 2.2-3), projects that are more appropriately considered by another TIG, and/or projects that are more clearly aligned with other restoration types were removed from consideration.

Table 2.2-2. Project Alternatives that Were Combined with Similar Projects

Agency/Entity/Person	Project Name*
Louisiana Office of State Parks	Cypremort Point State Park
Coastal Conservation Association (CCA) Louisiana	Cypremort Point State Park
LDWF	Grand Isle LDWF Lab
CCA Louisiana	Grand Isle, WLF Lab
LDWF	Des Allemands Boat Launch
St. Charles Parish	Des Allemands Boat Launch in St. Charles Parish
LDWF	Berwick
St. Mary Parish	Fishing Pier at Fontenot Boat Launch (Berwick) in St. Mary Parish
St. Mary Parish Government	Fishing Pier at Fontenot Boat Launch (Berwick) in St. Mary Parish
LDWF	Seawall Lights
CCA Louisiana	Lakeshore Drive Fishing Lighting
LDWF	Highway 90 Boat Launch Improvements
St. Charles Parish	Highway 90 Boat Launch in St. Charles Parish
City of Westwego	Wetland Harbor Activities Recreational Facility (WHARF) Project: Wetlands Harbor Activities in Jefferson Parish
LDWF	WHARF
Jefferson Parish	WHARF (CS-4); Jefferson Parish; Region 2; Barataria Basin

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Agency/Entity/Person	Project Name*
LDWF	Deatonville
CCA Louisiana	Deatonville
LDWF	Bubba Dove
CCA Louisiana	Bubba Dove Pier
LDWF	Fourchon
CCA Louisiana	Fourchon Public Launch
LDWF	Williams Boulevard
CCA Louisiana	Lake Pontchartrain at Williams Boulevard
LDWF	Bayou Pointe Aux Chenes Fishing Piers; Lafourche and Terrebonne Parishes; Regions 2 and 3; Terrebonne Basin
LDWF	Pirogue Launch
LDWF	Pirogue Pull-Overs
LDWF	PAC Fishing Piers
LDWF	Island Road Launch
LDWF	Montegut S1/S2 Access
Louisiana Office of State Parks	Grand Isle State Park I
Louisiana Office of State Parks	Grand Isle State Park II
Louisiana Office of State Parks	Bayou Segnette State Park I
Louisiana Office of State Parks	Bayou Segnette State Park II
Louisiana Office of State Parks	Palmetto Island State Park I
Louisiana Office of State Parks	Palmetto Island State Park II
Louisiana Office of State Parks	Sam Houston Jones State Park I
Louisiana Office of State Parks	Sam Houston Jones State Park II
Louisiana Office of State Parks	St. Bernard State Park I
Louisiana Office of State Parks	St. Bernard State Park II
LDWF	Rockefeller Piers
LDWF	Rockefeller Signage
Audubon Nature Institute	Coastal Wetlands Education Center at Audubon Nature Institute in Orleans Parish
Audubon Nature Institute	Louisiana Wetlands Gallery at the Aquarium

Note: Grey shading and double bolded lines in the table indicate projects that were combined during Step 1.

* Project names are taken directly from the project universe and are lightly edited for clarity (see Appendix B).

Table 2.2-3. Project Alternatives Removed Because They Were Already Considered for Funding Under LA TIG RP/EA #2

Agency/Entity/Person	Project Name*
LDWF	Island Road Piers
Coastal Conservation Association (CCA) Louisiana	East Calcasieu Reef Area
CCA Louisiana	Point Mast Reef Expansion
CCA Louisiana	Nearshore Reef Planning Areas
CCA Louisiana	Elmer's Island
Environmental Defense Fund; Louisiana Wildlife Federation; National Audubon Society; National Wildlife Federation; Restore or Retreat	Elmer's Island: Enhanced Recreational Opportunities in Jefferson Parish
CCA Louisiana	Cypremort Point Reef

* Project names are taken directly from the project universe and are lightly edited for clarity (see Appendix B).

Table 2.2-4 lists those project alternatives that did not meet the Step 1 criteria because they were not recreational use projects or did not have a clear nexus to the Provide and Enhance Recreational Opportunities restoration type. Project alternatives that met all of the above criteria received further consideration for this restoration plan by moving on to Step 2, Initial Screening Criteria.

Table 2.2-4. Project Alternatives Deferred in Step 1

Agency/Entity/Person	Project Name*	Reason for No Further Consideration
Louisiana Board of Regents	Retrofit LUMCON Vessel	This project does not have a clear nexus to the Provide and Enhance Recreational Opportunities restoration type.
Audubon Nature Institute	Signature Film – Hurricane on the Bayou	This project does not have a clear nexus to the Provide and Enhance Recreational Opportunities restoration type.
USFWS Coalition to Restore Coastal Louisiana	Plant marsh grass and trees in Louisiana's coastal zone using volunteers in Cameron, Orleans, St. Tammany, Tangipahoa, Vermilion Parishes.	This project does not have a clear nexus to the Provide and Enhance Recreational Opportunities restoration type.
Grand Isle Community Development Team	Grand Isle Butterfly Dome in Jefferson Parish	This project does not have a clear nexus to the Provide and Enhance Recreational Opportunities restoration type.
Lafourche Parish Game and Fish Commission; Ducks Unlimited; Barataria -Terrebonne National Estuary Program; Lafourche Parish Government	Lake Fields and Lake Long Water Quality Restoration Plan	This project does not have a clear nexus to the Provide and Enhance Recreational Opportunities restoration type.
LDEQ	Statewide Mercury Initiative Implementation	This project does not have a clear nexus to the Provide and Enhance Recreational Opportunities restoration type.

* Project names are taken directly from the project universe and are lightly edited for clarity (see Appendix B).

2.2.3 Initial Screening Criteria

2.2.3.1 NUTRIENT REDUCTION (NONPOINT SOURCE)

In the Initial Screening Criteria (Step 2) of the screening process, the LA TIG evaluated each of the nutrient reduction project alternatives against the restoration approach of reducing nutrient loads to coastal watersheds by employing agricultural CPs, as discussed in the Final PDARP/PEIS (DWH Trustees 2016:5-242). Using the set of projects identified as addressing the goals of nonpoint source nutrient reduction in the Louisiana Restoration Area (i.e., the product of the eligibility screening step above), the LA TIG further screened eligible projects.

First, the LA TIG determined whether a project alternative was designed to make a significant direct contribution to reducing nutrients from nonpoint sources on agricultural lands, primarily through implementation of active measures to reduce nutrient loadings to coastal ecosystems injured by the DWH Oil Spill. These measures could include the following:

- Agricultural CPs
- Stormwater management practices
- Forestry management practices
- Creation and enhancement of wetlands
- Hydrologic restoration
- Raising awareness of agricultural producers of the opportunity to participate in nutrient reduction project

Projects were eliminated if they proposed the following:

- Water reuse
- Study/assessment/data collection/monitoring (only)
- Drainage, streambank stabilization, and/or creek channeling
- Living shorelines
- Addressing point sources of nutrients (e.g., sewer infrastructure)
- Debris removal
- Drainage/flooding issues
- Recreational use
- Projects without a defined scope or insufficient information to evaluate
- Non-active measures such as conducting additional watershed planning
- Non-agriculture-based nutrient reduction approaches

Table 2.2-5 lists those nutrient reduction project alternatives that did not pass the Step 2 screening process. Aspects of the LDEQ project named Nutrient Management of Easements (see Table 2.2-5) were combined with alternatives that did pass the Step 2 screening process.

Table 2.2-5. Nutrient Reduction Project Alternatives Deferred in Step 2

Agency/Entity/Person	Project Name*	Reason for No Further Consideration
Lafourche Parish Game and Fish Commission; Ducks Unlimited; Barataria - Terrebonne National Estuary Program; Lafourche Parish Government	Lake Fields and Lake Long Water Quality Restoration Plan	This project falls outside of the preferred restoration approach.
Lafourche Parish Game and Fish Commission	Lake Fields Hydrologic Restoration	This project falls outside of the preferred restoration approach.
The Nature Conservancy	Nutrient Reduction Pilot Projects in the Mississippi Valley	Insufficient information was provided to carry this project forward.
The Conservation Fund; Natural Resources Conservation Service Louisiana; National Fish and Wildlife Foundation	Vermillion Parish Working Lands, Water, and Wildlife Partnership	This project did not contain any active measures to reduce nutrient loading.
The Conservation Fund; Louisiana Department of Wildlife and Fisheries	Joyce Wildlife Management Area – Land Acquisition	This project did not contain any active measures to reduce nutrient loading.
Mississippi-Alabama Sea Grant Consortium (on behalf of Louisiana State University)	Joyce Wildlife Management Area	This project falls outside of the preferred restoration approach.
LDEQ	Nutrient Management of Easements	Aspects of this project are combined with the preferred alternatives, but this project is not carried forward as a standalone project.

* Project names are taken directly from the project universe and are lightly edited for clarity (see Appendix B).

Remaining proposals were further evaluated by the LA TIG and categorized into themes. The primary goal of these project themes is to improve water quality through nutrient reduction on agricultural lands. The themes are as follows:

- Theme 1: Nutrient Reduction on Dairy Farms
- Theme 2: Nutrient Reduction on Cropland and Grazing Land
- Theme 3: Winter Water Holding on Cropland

Project alternatives that fell within these themes were then prioritized by the LA TIG. Project alternatives were prioritized by clustering projects at the HUC 12 watershed scale and focusing on the watersheds that would most directly impact coastal wetlands. Project alternatives that were associated with one of the three themes and occurred within watersheds most directly impacting coastal wetlands progressed onto the next step of the screening process (OPA criteria screening).

2.2.3.2 PROVIDE AND ENHANCE RECREATIONAL OPPORTUNITIES

In the second step of the screening process for recreational use, the LA TIG evaluated each of the project alternative's merits to increase or enhance the public's ability to access a variety of recreational resources such as fishing, beach going, camping, and boating. The following screening criteria were used to identify merits of each project alternative:

- Is there clear evidence of property ownership or a lease in place that will provide public access for the duration of the project alternative?
- Does the project alternative provide access to public resources and recreational opportunity?
- Does the project require long-term maintenance? If so, has an entity and funding source been identified for the project life expectancy?
- What is the project alternative's probability of successfully meeting the Final PDARP/PEIS goals?
- Does the project alternative either
 - create new recreational access or opportunity where a need exists, but there is little or no access currently; or
 - enhance existing recreational access or opportunity in an area of need?
- Is the project alternative consistent with the goals and objectives of state or local government plans?
- Does the project alternative benefit a large portion of the population and have little or no restriction to public access?
- Is the project alternative's cost reasonable and appropriate?
- Is the project alternative complementary to other public recreational projects in the region/area?
- Does the project alternative exceed \$8 million in construction costs? If so, is it scalable?

The project alternatives were then categorized into three "tiers" of projects, based on the likelihood of the project alternative providing or enhancing public recreational access and opportunity and/or using education and outreach to promote engagement in restoration and stewardship of natural resources:

- Tier I projects are highly likely to provide and enhance recreational use and opportunity and/or education and outreach.
- Tier II projects are likely to provide or enhance recreational use and opportunity and/or education and outreach.
- Tier III projects are the least likely to provide and enhance adequate recreational use and opportunity and/or education and outreach benefits. Projects that lacked sufficient information to determine the likelihood of success were also placed into Tier III.

Table 2.2-6 lists those project alternatives that were deferred during initial screening. Project alternatives that were categorized as Tier I moved onto the next step of the screening process, where the LA TIG evaluated each alternative against the OPA criteria.

Table 2.2-6. Recreational Use Project Alternatives Deferred in Step 2

Agency/Entity/Person	Project Name*	Reason for No Further Consideration
Louisiana Office of State Parks	Marketing	This project would reach a modest portion of the public, has a limited service area, has unknown recreation opportunities, and property ownership is unknown.
LDWF	Maurepas	This project's property ownership is unknown or in question, public recreation access is marginal, and the project would be located where demand is limited.
LDWF	Old Highway 1	This project's property ownership is unknown or in question, project maintenance is in question or could exceed the project's life expectancy.
LDWF	Fort Pike	This project's consistency with state or local plans is in question
LDWF	Oak Ridge	This project's property ownership is unknown or in question, maintenance is in question, and consistency with state or local plans is in question.
LDWF	Highway 11/I-10	This project's property ownership is unknown or in question and maintenance is in question.
Coastal Conservation Association (CCA) Louisiana	St. John Reef Area	This project's cost is not reasonable and appropriate.
CCA Louisiana	Cypremore Point Floating Islands Installation	The project's opportunities for public recreation are poor, limited, or unknown; project maintenance is in question; the probability of successfully accomplishing PDARP goals is limited; and demand is limited.
CCA Louisiana	Plaquemine Parish Reef	This project's property ownership is unknown or in question and the project's cost is not reasonable and appropriate.
CCA Louisiana	Vermillion Parish Floating Islands Installation	The opportunities for public recreation are poor, limited, or unknown; project maintenance is in question; the probability of successfully accomplishing PDARP goals is limited; and demand is limited.
CCA Louisiana	Calcasieu Lake – Joes Cove	This project's property ownership is unknown or in question and project maintenance is in question.
CCA Louisiana	Calcasieu Lake – Southeast Corner	This project's property ownership is unknown or in question and project maintenance is in question.
CCA Louisiana	Calcasieu Lake – West Cove	This project's property ownership is unknown or in question and project maintenance is in question.
CCA Louisiana	Sabine National Wildlife Refuge	This project's demand is limited, as other launches exist in the immediate vicinity.
CCA Louisiana	Mermentau	The maintenance for this project is in question and this project's cost is only somewhat reasonable and appropriate.
CCA Louisiana	Lake Pontchartrain at Bucktown	This project's property ownership is unknown or in question, project maintenance is in question, and demand is limited.
CCA Louisiana	Highway 1, Caminada Bridge Launch	This project's property ownership is unknown or in question and project maintenance is in question.
CCA Louisiana	Highway 1, Caminada Bridge Launch (Old Caminada Bridge)	This project's property ownership is unknown or in question and project maintenance is in question.
CCA Louisiana	Lake Pontchartrain at Pass Manchac	This project's property ownership is unknown or in question, project maintenance is in question, and the project's costs is not reasonable and appropriate.
CCA Louisiana	Lake Pontchartrain, Southshore near I-10	This project's property ownership is unknown or in question and project maintenance is in question.
CCA Louisiana	Chef Pass	This project's property ownership is unknown or in question and project maintenance is in question.

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Agency/Entity/Person	Project Name*	Reason for No Further Consideration
CCA Louisiana	Fort Jackson Fishing Pier	This project's maintenance is in question, the project is not identified in local plans, and the cost is only somewhat reasonable and appropriate.
CCA Louisiana	Empire, Bay Adams	This project's property ownership is unknown or in question and project maintenance is in question.
CCA Louisiana	Yellow Cotton Bay, Venice	This project's property ownership is unknown or in question and project maintenance is in question.
CCA Louisiana	Highway 1, Leeville Launch	This project's property ownership is unknown or in question and project maintenance is in question.
CCA Louisiana	Shell Beach	This project's property ownership is unknown or in question and project maintenance is in question.
CCA Louisiana	Mandeville Boat Harbor	This project's property ownership is unknown or in question, project maintenance is in question, and demand is limited.
CCA Louisiana	Bayou Dularge	This project's property ownership is in question, opportunities for public recreation are poor or unknown, and project maintenance is in question.
CCA Louisiana	Dulac Launch	This project's property ownership is unknown or in question and project maintenance is in question.
CCA Louisiana	Bayou Point-aux-Chenes	This project's property ownership is unknown or in question, project maintenance is in question, demand is limited, and the project's cost is not reasonable and appropriate.
CCA Louisiana	Vermillion, Intercoastal City Launch and	This project's property ownership is unknown or in question, project maintenance is in question, and the project's cost is not reasonable and appropriate.
CCA Louisiana	Davis Pond	This project's property ownership is unknown or in question, project maintenance is in question, and demand is limited.
CCA Louisiana	East Point a la Hache	This project's property ownership is unknown or in question and project maintenance is in question.
CCA Louisiana	Bayou Bienvenue at Paris Road	This project's property ownership is unknown or in question and project maintenance is in question.
Lake Pontchartrain Basin Foundation	Lake Pontchartrain Beach	This project's construction costs are greater than \$8 million, and this project is not scalable.
Audubon Nature Institute	Traveling Exhibits	This project's probability of successfully accomplishing PDARP/PEIS goals is limited, demand is limited, and cost is not reasonable and appropriate.
Beadfilters	Marine Finfish Hatchery for Stock Enhancement of Important Recreational Species Affected by the Oil Spill	Property ownership for this project is in question, opportunities for public recreation are poor or limited, project maintenance is in question, probability of successfully accomplishing PDARP goals is limited, demand is limited, the project benefits only a modest portion of the public, the cost is not reasonable and appropriate, and costs are greater than \$8 million and not scalable.
Jefferson Parish	Town of Jean Lafitte Kayak and Pirogue Recreational Building and Education Program in Jefferson Parish	Opportunities for public recreation for this project are marginal, demand and need are not exceptionally high, and there are some access restrictions to a portion of the public.
St. Charles Parish	Highway 90 Boat Launch in St. Charles Parish	This project's ownership is in question, and opportunities for public recreation are limited.
The Conservation Fund LDWF	Joyce Wildlife Management Area-Land Acquisition	This project's demand and need are not exceptionally high.
LDWF CCA Louisiana	Grand Isle LDWF Lab	This project may have some access restrictions to a portion of the public.

Agency/Entity/Person	Project Name*	Reason for No Further Consideration
LDWF CCA Louisiana	Deatonville	This project's property ownership is unknown or in question and project maintenance is in question.
LDWF CCA Louisiana	Bubba Dove	This project's property ownership is unknown or in question, project maintenance is in question, and there may be inconsistencies with state or local plans.
LDWF CCA Louisiana	Fourchon	This project's property ownership is unknown or in question and project maintenance is in question.
LDWF CCA Louisiana	Williams Blvd	This project's property ownership is unknown or in question and project maintenance is in question.
Jefferson Parish LDWF	Wetland Harbor Activities Recreational Facility (WHARF) (CS-4); Jefferson Parish; Region 2; Barataria Basin	This is a duplicate project to one already considered. Certain features of this project were carried forward.

* Project names are taken directly from the project universe and are lightly edited for clarity (see Appendix B).

2.2.4 Preliminary OPA Criteria Screening

For both restoration types considered in this plan, the LA TIG applied the OPA criteria to each project alternative in order to identify which projects are most likely to address resource injuries and further the restoration type's goals and priorities. The LA TIG also used the OPA criteria to help prioritize the project alternatives. It should be noted that the application of OPA criteria in this step of the screening process (Step 3) was not intended to be as rigorous as or substitute for the OPA evaluation that is conducted later in this restoration plan; Step 3 was intended to be a preliminary assessment of the OPA criteria.

To conduct the preliminary OPA criteria screening and prioritize project alternatives, the LA TIG used an evaluation matrix. Using the matrix, the LA TIG was able to determine if project alternatives met the OPA evaluation criteria at a preliminary level. The project alternatives that passed the preliminary OPA screening were categorized as follows:

- Tier 1: High-priority project alternatives. These projects were recommended for continued development and technical review. Projects in this tier likely require further development but there are no or few questions about technical feasibility.
- Tier 2: Priority project alternatives. These projects require additional information related to project status or suitability to determine if further development should be conducted, including considering project alternatives in tandem to increase their individual effectiveness or feasibility collectively.
- Tier 3: Low-priority project alternatives. These projects are not a priority at this time but may be reconsidered in future restoration plans or if new information becomes available.

Table 2.2-7 outlines the OPA evaluation criteria used during this preliminary step of the screening process. When evaluating a project alternative, the LA TIG assigned a positive, neutral, or negative value for each of the OPA criteria, based on the project's ability to address the OPA criteria.

Table 2.2-7. High-Level Oil Pollution Act Screening Criteria Matrix

OPA Criteria	Description of Criteria	High-Level Screening Approach
The cost to carry out the alternative, i.e., cost effectiveness	The anticipated costs of the project alternative. The LA TIG considered the estimate of costs provided in the project alternative submittal, in conjunction with knowledge of what a project should cost, based on professional judgment and experience with similar projects.	<p>+: Project alternative uses a highly cost-effective approach/technique to provide a high cost-to-benefit ratio or can be scaled to achieve a high cost-to-benefit ratio.</p> <p>0: Project alternative costs are reasonable with a moderate cost-to-benefit ratio or the project is scalable to achieve a reasonable cost-to-benefit ratio.</p> <p>- Project alternative is not likely to be cost effective or provide a reasonable cost-to-benefit ratio.</p>
The extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses	The project alternative's nexus to the resource injuries described in the Final PDARP/PEIS. The LA TIG considered the alternative's readiness, including the project's ability to comply with regulatory requirements or implement proposed activities in a timely manner. Their evaluation included considering the time to derive benefits from the alternative.	<p>+: Project alternative proposes or supports restoration that demonstrates a strong nexus to injury, will result in substantial restoration of targeted natural resources and services, and benefits will be derived in an acceptable amount of time to meet the Trustees' goals and objectives.</p> <p>0: Proposed project alternative activities present a nexus to injury but may not result in restoration that meets the Trustees' goals and objectives or benefits may not be derived in an acceptable amount of time.</p> <p>- Proposed project alternative activities do not demonstrate a nexus to injury and do not clearly meet the Trustees' goals and objectives.</p>
The likelihood of success of each alternative	The project alternative's likelihood of being successful and achieving the restoration type's goals. The LA TIG considered the restoration approaches and techniques proposed by the alternative, and if those techniques/approaches are routinely used, or if new/novel techniques/approaches are proposed. Past experience and professional judgement were used by the LA TIG to help assess the likelihood of success.	<p>+: The project alternative demonstrates a high likelihood of success due to high technical feasibility.</p> <p>0: The project alternative is likely to succeed based on the proposed technical approach.</p> <p>-: The project alternative does not demonstrate an acceptable likelihood of success due to uncertain or risky technical feasibility.</p>
The extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative	The impact of implementing the project alternative. The LA TIG considered direct or indirect collateral environmental impacts resulting from the implementation of projects. Impacts in the immediate location, adjacent to, or distant from the project location were considered. The extent to which the project is consistent with federal, state, or local laws, regulations, or policies was also considered.	<p>+: The project alternative implements restoration that will increase resilience of target resources or their ecological functions and fully prevents or avoids collateral injury to surrounding resources. The project demonstrates consistency with applicable laws and regulations.</p> <p>0: The project alternative is likely to increase resilience of target resources or their ecological functions and avoid collateral injury to surrounding resources. Additional information is needed to determine level of consistency with applicable laws and regulations.</p> <p>-: The project alternative does not demonstrate that restoration activities will result in increased resilience to target resources or their ecological functions or implementation may result in collateral injury to surrounding resources.</p>
The extent to which each alternative benefits more than one natural resource and/or service	The full benefits of project implementation. The LA TIG evaluated a project alternative's ability to provide multiple resource benefits.	<p>+: The project alternative is likely to provide multiple benefits for more than one natural resource and/or service.</p> <p>0: The project alternative is likely to benefit more than one natural resource and/or service.</p> <p>-: The project alternative does not benefit more than one natural resource and/or service.</p>

OPA Criteria	Description of Criteria	High-Level Screening Approach
The effect of each alternative on public health and safety	The project alternative's impact on public health and safety. The LA TIG considered if there are any aspects of the project alternative that could negatively affect public health and safety, especially those impacts that cannot be mitigated.	<p>+: The project alternative is not likely to negatively affect public health and safety.</p> <p>0: More detailed information or review is needed to determine if any activities are likely to adversely affect public health and safety.</p> <p>-: Project alternative activities may adversely affect public health and safety.</p>

All nutrient reduction alternatives passed through the preliminary OPA screening.

Table 2.2-8 lists those recreational use project alternatives that were deferred during preliminary OPA screening. Project alternatives that were categorized as Tier I moved onto the next step of the screening process.

Table 2.2-8. Recreational Use Project Alternatives Deferred in Step 3

Agency/Entity/Person	Project Name*	Reason for No Further Consideration
Louisiana Office of State Parks	Atchafalaya Basin Conservation Learning Center	There are other similar projects within the area that already provide similar services and opportunities that this project would cover, thereby reducing its cost-benefit ratio.
LDWF	Fishing Pier at Fontenot Boat Launch (Berwick) in St. Mary Parish	This project is not as cost-effective as other projects, and would not meet the Trustees' goals and objectives compared to other similar projects.
LDWF	Bonnet Carre	The extent to which this project benefits other resources or services is reduced compared to other similar projects.
LDWF Coastal Conservation Association (CCA) Louisiana	Lakeshore Drive Seawall Lights	The project costs are high. Project activities present a nexus to injury but may not result in restoration that meets the Trustees' goals and objectives, or benefits may not be derived in an acceptable amount of time.
LDWF	Port Sulphur	This project's likelihood of success is less compared to other similar projects.
CCA Louisiana	Lake Pontchartrain at West End Boulevard	Project activities present a nexus to injury but may not result in restoration that meets the Trustees' goals and objectives, or benefits may not be derived in an acceptable amount of time.
LDWF	I-10 Bridge/Lake Charles	Project activities present a nexus to injury but may not result in restoration that meets the Trustees' goals and objectives, or benefits may not be derived in an acceptable amount of time.
LDWF	Cane Bayou	Project activities present a nexus to injury but may not result in restoration that meets the Trustees' goals and objectives, or benefits may not be derived in an acceptable amount of time.
USFWS	Promote public access and recreational use through hydrologic restoration of Bayou Sauvage channel, Bayou Sauvage National Wildlife Refuge, in Orleans Parish.	Compared to similar projects, this project may not meet the Trustee's goals and objectives for recreational use as cost effectively.

* Project names are taken directly from the project universe and are lightly edited for clarity (see Appendix B).

The Step 3 OPA preliminary screening process resulted in the LA TIG recommending eight nutrient reduction project alternatives and 23 recreational use project alternatives for development into a reasonable range of alternatives and inclusion in this restoration plan.

2.3 Summary of Alternatives Considered but not Carried Forward for Further Evaluation in this RP/EA

The LA TIG considered a total of 24 project alternatives to reduce nutrient loads to coastal watersheds and 117 project alternatives to compensate for lost recreational use, consistent with the injuries caused by the DWH Oil Spill. Appendix B includes the complete project alternative universe considered and evaluated using the LA TIG screening criteria as described above.

Through LA TIG’s screening process as described above in Section 2.2, 11 nutrient reduction and 39 recreational use project alternatives were combined or screened out during the eligibility screening (Step 1). Five nutrient reduction and 46 recreational use project alternatives were deferred by the initial screening process (Step 2). All remaining nutrient reduction alternatives were carried forward after the preliminary OPA criteria screening process (Step 3), whereas nine recreational use project alternatives were deferred. In all, 16 nutrient reduction and 94 recreational use project alternatives were not carried forward for, or were combined prior to, further evaluation in this RP/EA.

2.4 Reasonable Range of Alternatives

The screening steps identified eight reasonable alternatives for nutrient reduction and 23 reasonable alternatives for recreational use, to be carried forward for detailed OPA and NEPA analysis (Table 2.4-1 and 2.4-2). Detailed descriptions and OPA evaluation for each alternative are in Section 3.

Table 2.4-1. Nutrient Reduction Alternatives

Agency	Alternative Name	Location (Parish)
USDA	Theme 1: Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes	St. Helena and Tangipahoa
USDA	Theme 1: Nutrient Reduction on Dairy Farms in Washington Parish	Washington
USDA	Theme 2: Nutrient Reduction on Cropland and Grazing Land in Bayou Folse	Lafourche and Terrebonne
USDA	Theme 2: Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes	Concordia, Catahoula, and Tensas
USDA	Theme 2: Nutrient Reduction on Cropland and Grazing Land in Iberia, St. Mary, and Vermilion Parishes	Iberia, St. Mary, and Vermilion
USDA	Theme 3: Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices	Vermilion and Cameron
USDA	Theme 3: Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes	St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis
USDA	Theme 3: Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes	Concordia, Tensas, and Catahoula

Table 2.4-2. Recreational Use Alternatives

Agency/Entity/Person	Alternative Name	Location (Parish)
LDWF	Pass-a-Loutre Wildlife Management Area Crevasse Access	Plaquemines
LDWF	Pass-a-Loutre Wildlife Management Area Campgrounds	Plaquemines
Louisiana Office of State Parks	Grand Isle State Park Improvements	Jefferson
Chitimacha Tribe of Louisiana	Chitimacha Boat Launch	St. Mary
Louisiana Office of State Parks	Sam Houston Jones State Park Improvements	Calcasieu
LDWF	Pointe-aux-Chenes Wildlife Management Area Recreational Use Enhancement	Terrebonne
City of Westwego	WHARF Phase 1	Jefferson
Louisiana Office of State Parks	Bayou Segnette State Park Improvements	Jefferson
LDWF	Atchafalaya Delta Wildlife Management Area Access	St. Mary
LDWF	Atchafalaya Delta Wildlife Management Area Campgrounds	St. Mary
LDWF	Rockefeller Piers and Rockefeller Signage	Cameron
Louisiana Office of State Parks	St. Bernard State Park Improvements	St. Bernard
Louisiana Office of State Parks	Cypremort Point State Park Improvements	St. Mary
Town of Jean Lafitte	The Wetlands Center	Jefferson
National Park Service	Recreational Use Improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit	Jefferson
St. Charles Parish	Des Allemands Boat Launch	St. Charles
LDWF	Middle Pearl	St. Tammany
St. Mary Parish	Improvements to Grand Avoille Boat Launch	St. Mary
Plaquemines Parish	Belle Chasse	Plaquemines
Town of Grand Isle	Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin	Jefferson
Louisiana Office of State Parks	Palmetto Island State Park Improvements	Vermilion
Audubon Nature Institute	Louisiana Swamp Exhibit at Audubon Zoo	Orleans
Audubon Nature Institute	Louisiana Wetlands Gallery at Audubon Aquarium	Orleans

2.4.1 Natural Recovery/No Action Alternative

As required by OPA regulations, the Final PDARP/PEIS considers a “natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline” (15 CFR 990.53[b][2]). Under a natural recovery alternative, no additional restoration would be done by the Trustees to accelerate the recovery of injured natural resources or to compensate for lost services. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: 1) gradual recovery, 2) partial recovery, 3) no recovery, or 4) further deterioration. Although injured resources could presumably recover to baseline or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. The Final PDARP/PEIS (DWH Trustees 2016:5-92) notes that

interim losses of natural resources, and the services natural resources provide, would not be compensated under a natural recovery/no action alternative. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, tiering this RP/EA from the Final PDARP/PEIS, and incorporating that analysis by reference, the LA TIG did not evaluate natural recovery as a viable alternative under OPA. Natural recovery is not considered further in this RP/EA. For these reasons, the LA TIG rejects the natural recovery/no action alternative as a viable means of compensating the public for the lost recreational use and water quality injuries caused by the DWH Oil Spill.

NEPA requires consideration of a no action alternative as a basis for comparison of potential environmental consequences of the action alternatives(s). Therefore, a no action alternative is evaluated within the environmental assessment portion of this RP/EA. The no project analysis presents the conditions that would result if the LA TIG did not select to undertake any additional restoration for injured natural resources or to compensate for lost services at this time. The environmental consequences of such an alternative are evaluated in Section 4.4 for comparison with the remaining alternatives.

3 OIL POLLUTION ACT EVALUATION OF ALTERNATIVES

3.1 Section Content Review

According to the NRDA regulations under OPA, trustees are responsible for identifying a reasonable range of alternatives (15 CFR 990.53[a][2]) that can be evaluated based on the OPA evaluation standards (15 CFR 990.54). Section 2 describes the screening and identification of a reasonable range of alternatives for evaluation under OPA. Once a reasonable range of alternatives is developed, the OPA NRDA regulations (15 CFR 990.54) require trustees to identify preferred restoration alternatives based on the following criteria:

- The cost to carry out the alternative
- The extent to which each alternative is expected to meet the trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses (the ability of the alternative to provide comparable resources and services; that is, the nexus between the project and the injury)
- The likelihood of success of each alternative
- The extent to which each alternative will prevent future injury as a result of the incident, and avoid collateral injury as a result of implementing the alternative
- The extent to which each alternative benefits more than one natural resource and/or service
- The effect of each alternative on public health and safety

If the Trustees conclude that two or more alternatives are equally preferable, the most cost-effective alternative must be chosen (15 CFR 990.54(b)).

The following section describes the considerations the LA TIG included when performing the OPA evaluation of these alternatives. This evaluation process follows the OPA criteria found in 15 CFR 990.54(a), as well as the Final PDARP/PEIS and public comments. This evaluation is separate from the Step 3 preliminary OPA screening process detailed above in Section 2.2.4 that was used to develop the reasonable range of alternatives. For each alternative, the OPA criteria are evaluated independently, and a determination is made on how well the alternative meets that element. The LA TIG applied each of the OPA criteria to the reasonable range of alternatives in this section to provide 1) a summary explanation of the types of questions and analysis raised under each of the OPA criteria, and 2) a narrative summary of each alternative's evaluation with respect to those criteria.

3.1.1 Summary of Oil Pollution Act Evaluation Criteria

3.1.1.1 PROJECT COSTS

The following questions were asked in the evaluation of each alternative as it pertains to cost effectiveness:

- Is there a description of the anticipated costs of the alternative?
- Are the costs of the alternative (including land acquisition, design, construction, management, monitoring, and maintenance) reasonable, appropriate, and comparable to other equivalent restoration alternatives?

The cost provided for each alternative is the estimated NRDA-funded cost to implement the alternative. This cost reflects current cost estimates developed from the most current designs and information available to the LA TIG at the time of drafting this restoration plan. The estimated cost could include provisions for planning, E&D, construction, monitoring, trustee oversight, and contingencies.

3.1.1.2 TRUSTEE RESTORATION GOALS AND OBJECTIVES

3.1.1.2.1 Nutrient Reduction Alternatives

The LA TIG's analysis addresses the nutrient reduction alternatives' nexus to the natural resource injury as described in the Final PDARP/PEIS. Each of the following components of this element is evaluated independently and qualitatively, where appropriate:

- Nexus to injury: Alternatives are evaluated on their ability to reduce nutrient loads and improve the coastal environment and resources in Gulf of Mexico coastal watersheds.
- Benefit to injured resources: Each of the following points captures elements necessary to evaluate the relative benefits of the nutrient reduction alternatives:
 - Component benefits: What are the anticipated water quality benefits of the alternative? What attributes of the alternative are expected to reduce nutrient loading of coastal watersheds?
- Scope of benefits: What is the scope of the anticipated water quality benefits? What information is available on the level of current nutrient loading at the site of the alternative? What are the beneficial impacts expected after implementation of the alternative (e.g., reduction in nitrogen, fecal coliform bacteria from nonpoint and animal waste, and phosphorous entering waterways, etc.)? What is the timing of the anticipated benefits?
- Location: Where is the alternative located in the watershed? Does the watershed directly impact coastal wetlands?
- Additional benefit considerations: What is the magnitude of additional benefits from the alternative in comparison to the existing state of the resource?

3.1.1.2.2 Recreational Use Alternatives

The LA TIG's analysis addresses each alternative's nexus to the lost recreational use injury as described in the Final PDARP/PEIS while also evaluating the nature, magnitude, and distribution of the recreational benefits expected to be provided to the public by each alternative. Each of the following components of this element is evaluated independently and qualitatively, where appropriate:

- Nexus to injury: Alternatives are evaluated on their ability to benefit individuals who visit Louisiana coastal areas for the primary purpose of engaging in fishing, boating, vacationing, camping, beach going, and other recreational activities.
- Benefit to injured resources: Each of the following points captures elements necessary to evaluate the relative benefits of the restoration alternatives:
 - Component benefits: What are the anticipated recreational benefits of the alternative? What are the attributes of the alternative that are expected to increase or improve the recreational experience? Examples of attributes that are expected to increase or improve recreational use experiences include
 - reductions in marine debris;
 - new or improved access points (e.g., fishing piers, parking);

- amenities (e.g., bathrooms, walking paths, birding areas); and
 - public education and stewardship opportunities related to Louisiana’s fisheries and natural resources.
- **Scope of benefits:** What is the scope of the anticipated recreational benefits? What information is available on the level of current use at the alternative site and the beneficial impacts expected after implementation of the alternative (e.g., an increase in visits to a site, a greater number of individuals experiencing enhanced recreational values, an increase in acreage of available recreational areas, a greater number of new access points)? What is the timing of the anticipated benefits?
 - **Public access:** How will members of the public be able to access the benefits associated with the alternative?
 - Could users be excluded from enjoying the benefits of an alternative? Do any potential exclusions disproportionately affect any demographic subset of the population?
 - **Location:** Where is the alternative located? Considerations for siting restoration include:
 - Availability of substitutes (e.g., if there are fewer nearby available sites that provide similar recreational benefits, the alternative may convey a higher value)
 - Uniqueness of restoration (e.g., if the recreational amenities proposed are unique, it may lead to more long-distance trips to the site and possibly higher per-trip values)
 - **Additional benefit considerations:** What is the magnitude of additional benefits from the alternative in comparison to the existing state of the resource?

3.1.1.3 LIKELIHOOD OF SUCCESS

The likelihood of success for each alternative was analyzed using a series of questions:

- Does the alternative propose restoration approaches or techniques that the LA TIG has previously executed successfully?
- Is the restoration approach or technique routinely used?
- How did these past experiences inform the development of the alternative so as to increase its likelihood of success?
- For novel or new techniques, has the LA TIG incorporated any measures to minimize risk?
- Has the LA TIG considered the uncertainties influencing success and any adaptive management approaches that would address those uncertainties?

3.1.1.4 PREVENT FUTURE INJURY AND AVOID COLLATERAL INJURY

The extent to which each alternative would prevent future injury (a result of the incident) and avoid collateral injury (a result of implementing the alternative) was analyzed using the following question:

- Does the restoration alternative have direct or indirect collateral environmental impacts (positive or negative)?

Many of these considerations are covered in the Affected Environment and Environmental Consequences sections of this RP/EA (Sections 4.1 and 4.6).

3.1.1.5 BENEFITS TO MULTIPLE RESOURCES

Although each alternative is funded exclusively from one restoration type allocation, the LA TIG considered the importance of multiple resource benefits. This is done by evaluating whether alternatives convey multiple ecosystem service benefits (in addition to nutrient reduction or recreational use) that make them more valuable to the public (e.g., non-use [ecological] values, storm-protection benefits, and habitat and resource improvements that may benefit ecological resources injured by the DWH Oil Spill).

3.1.1.6 PUBLIC HEALTH AND SAFETY

The LA TIG considered whether there are any aspects of the alternative that could adversely affect public health and safety that cannot be mitigated.

3.1.2 Considerations for all Nutrient Reduction and Recreational Use Alternatives

For all alternatives,

- best management practices (BMPs) are discussed throughout Section 4 as relevant to avoiding adverse impacts to the physical, biological, and/or socioeconomic environment;
- MAM plans for the alternatives are located in Appendix C; and
- construction schedule(s) are included in this section; however, estimated construction timeframes may be refined during final project design.

3.2 Oil Pollution Act Evaluation of Nutrient Reduction Alternatives

3.2.1 Nutrient Reduction

Excessive nutrient enrichment, or eutrophication, of Gulf Coast estuaries and their watersheds is a chronic threat that can lead to hypoxia, harmful algal blooms, habitat loss, and fish kills (DWH Trustees 2016:Section 5.5.4). The primary goal for the nutrient reduction alternatives (Table 3.2-1) is water quality improvement through nutrient reduction. For each alternative, a group of HUC 12 watersheds were chosen for inclusion based on the findings published in the *FINAL 2016 Louisiana Water Quality Inventory: Integrated Report (305(b)/303(d))*. The HUC 12 watersheds for each alternative are identified as not meeting their designated uses for Primary Contact Recreation, Secondary Contact Recreation, and Fish and Wildlife Propagation (LDEQ 2016).

The health of the Gulf of Mexico depends upon the health of its estuaries, and the health of those coastal waters is influenced by land uses in the watersheds of its tributaries. nutrient reduction alternatives considered in this RP/EA would help to restore and enhance the ecological and hydrological integrity of our water resources, including improved water quality and ensuring natural water quantity levels to Louisiana coastal rivers and streams and coastal bays and estuaries. To this end, the objective of these alternatives is to reduce rural nonpoint source pollution at the source through the implementation of CPs on agricultural lands.

Table 3.2-1. Nutrient Reduction Alternatives by Themes

Theme 1: Nutrient Reduction on Dairy Farms
Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes
Nutrient Reduction on Dairy Farms in Washington Parish
Theme 2: Nutrient Reduction on Cropland and Grazing Land
Nutrient Reduction on Cropland and Grazing Land in Bayou Folsé
Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes
Nutrient Reduction on Cropland and Grazing Land in Iberia, St. Mary, and Vermilion Parishes
Theme 3: Winter Water Holding on Cropland
Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices
Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes
Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes

In Louisiana, 39% of the land use is agriculture (USDA 2017) and runoff from cropland, pasture, grassland, and forests contributes nutrients that adversely affect the health of coastal waters of the Gulf of Mexico. The nutrient reduction alternatives considered in this RP/EA would implement CPs in vulnerable areas to reduce nutrient losses from the landscape and reduce loads to streams and downstream receiving waters and thus provide benefits to coastal waters that have degraded coastal watersheds.

USDA would organize the selected alternatives into six implementation phases: 1) landowner outreach and education, 2) conservation planning, 3) engineering design and environmental compliance, 4) landowner contracts and agreements, 5) CP implementation/operations and maintenance, and 6) monitoring and adaptive management of the implemented CPs. The landowner outreach and education phase would include engaging landowners within each alternative’s footprint for the purpose of identifying nutrient reduction opportunities on private lands. The conservation planning phase would involve voluntary participation from landowners in the program in which they would receive technical assistance in preparing a conservation plan outlining selected CPs to address nutrient reduction on their property. The engineering design and environmental compliance phase would include the development of engineering plans and designs for structural practices; USDA’s assistance in obtaining required local, state, and federal permits; and a site-specific environmental evaluation. The landowner contracts and agreements phase would include a contractual agreement between USDA and the landowner for implementation of the conservation plan. The CP implementation/operations and maintenance phase would include implementation of construction activities, best practices, and operations and maintenance of the CPs included in the conservation plan. Monitoring and adaptive management of the CPs would follow the MAM plans developed for the nutrient reduction alternatives, which are located in Appendix C.

The implementation of these nutrient reduction alternatives would involve voluntary cooperation and support from landowners, who can improve nutrient application and management methods to decrease the amount of nutrients going into the watershed and ultimately discharging into coastal Gulf of Mexico waters. Voluntary conservation programs provide technical assistance to landowners and implement CPs that help reduce nutrient loads along the Gulf Coast. Under these nutrient reduction alternatives, USDA would work with landowners to develop site-specific conservation plans for each farming operation outlining a combination of CPs. The conservation plans would address water quality, CPs applied to address water quality, and project timeline for implementation.

CPs would be implemented on a site-specific basis and would vary depending on the physical conditions, characteristics, and environmental constraints (endangered species, cultural resources, etc.) associated with each site. Depending on site characteristics, CPs incorporated in the conservation programs could

include a combination of structural CPs, annual CPs, and/or long-term conservation cover establishment. These practices, once implemented, are generally considered permanent. Some examples include sediment basins to intercept runoff and retain pollutants and sediment on-site or drainage water management to reduce leaching of pollutants through the ground water. Annual CPs are practices that a landowner implements as part of the crop production system each year. These practices are primarily designed to promote soil quality, reduce in-field erosion, and reduce the availability of nutrients and pesticides for transport by wind or water. They include residue and tillage management, nutrient management practices, pesticide management practices, and cover crops. Identifying priority lands for implementation of this type of conservation can also provide a cost-effective opportunity to restore wetlands. This in turn would also provide beneficial habitat for migratory birds and other wildlife. Vegetative plantings can also be used in this practice to restore riparian buffers and wetlands or create grassed waterways to promote nutrient uptake and reduce nutrient loadings to nearby streams. Wetland restoration can also be conducted on farms where the landowner would convert marginal farmland soils back to their historical conditions. These types of projects provide multiple benefits, including reducing nutrient loads to nearby water bodies, providing critical habitat for migratory and native bird populations, enhancing groundwater recharge, and providing flood protection for watersheds. All or a combination of these practices could be implemented in coordination with landowners to reduce nutrient loadings to coastal watersheds across the Louisiana Gulf Coast.

3.2.2 Theme 1. Nutrient Reduction on Dairy Farms

Alternatives under Theme 1 are as follows:

- Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes
- Nutrient Reduction on Dairy Farms in Washington Parish

3.2.2.1 ALTERNATIVE DESCRIPTION

Although agricultural lands are not the sole or leading contributors of nutrients in the Lake Pontchartrain Basin, discharges from these lands do contribute to water quality impairment in the basin (U.S. Geological Survey [USGS] 2002). For this reason, opportunities exist to address this resource concern at dairy farms within the Lake Pontchartrain Basin located within St. Helena, Tangipahoa, and Washington Parishes. Currently, dairy farms in these watersheds are managing the waste component of their operations through waste treatment systems that were constructed in the early 1990s. The effluent waste application systems of these dairies are obsolete or marginal at best.

Given the success of USDA conservation programs such as Environmental Quality Incentive Program (EQIP) and their strong acceptance by landowners, there is a significant opportunity to implement CPs on dairy farms that would reduce the levels of nutrients and fecal coliform bacteria entering the Gulf of Mexico from the Lake Pontchartrain Basin. The primary goal of these alternatives is to enhance overall ecosystem health by benefitting the estuaries that are integral habitat for many of the Gulf of Mexico's ecologically and economically important species. Nutrients and fecal coliform bacteria originating from dairy operations can enter water bodies through runoff and have a considerable deleterious effect on water quality. Nutrient management planning and implementation of BMPs/CPs on dairy farms can improve water quality for the receiving water body and the downstream water bodies.

Conservation on dairy operations normally begins with a complete operational and natural resource assessment, conducted with the landowner's plans and objectives in mind, while striving to address existing water quality concerns associated with the operation. Ultimately, dairy waste concerns and objectives are addressed by developing and implementing a comprehensive waste management system. All enrolled dairy land tracts would be included in development of a comprehensive nutrient management plan (CNMP) which would be used to define all CP design parameters.

The proposed nutrient reduction on dairy farms alternatives would target efforts for measurable impact by clustering projects at the HUC 12 watershed scale that directly impact coastal wetlands (Figure 3.2-1). The identified HUC 12s are located within multiple parishes, and alternatives under Theme 1 are identified by the parishes in which the priority HUCs are located. The Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes alternative includes the Crittenden Creek-Tickfaw River and Beaver Creek Watersheds. The Nutrient Reduction on Dairy Farms in Washington Parish alternative includes the Gorman Creek-Tchefuncta River, Clifton, LA-Bogue Chitto, Muster Ground Creek-Pushepatapa Creek, Snell Branch-Silver Creek, Little Silver Creek-Silver Springs Creek, Crains Creek-Pushepatapa Creek, Lawrence Creek, and Mayfield Creek-Pearl River Watersheds. Activities associated with alternatives under Theme 1 would occur on private lands on a voluntary basis.

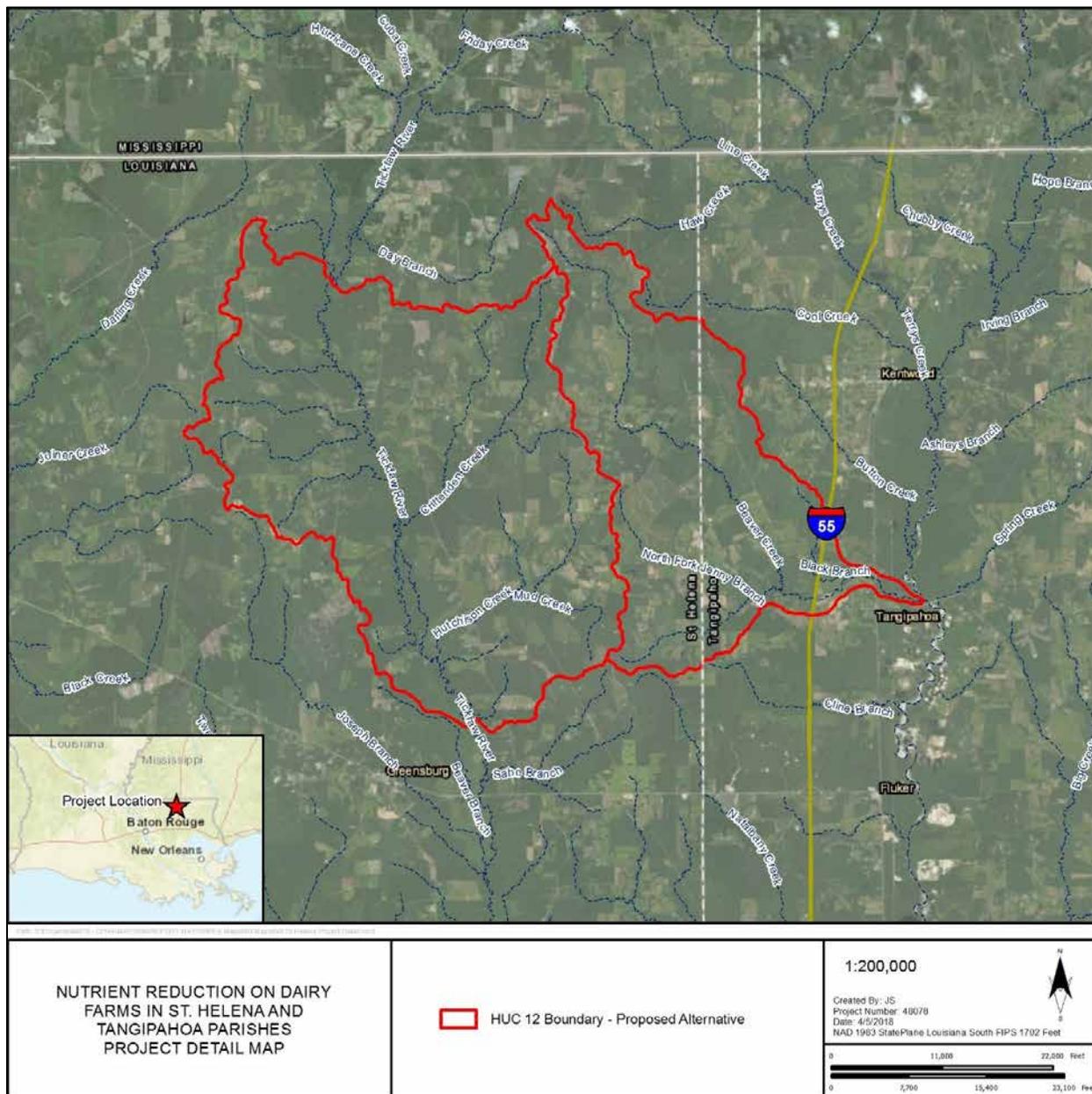


Figure 3.2-1a. Boundary for the Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes alternative, Theme 1.

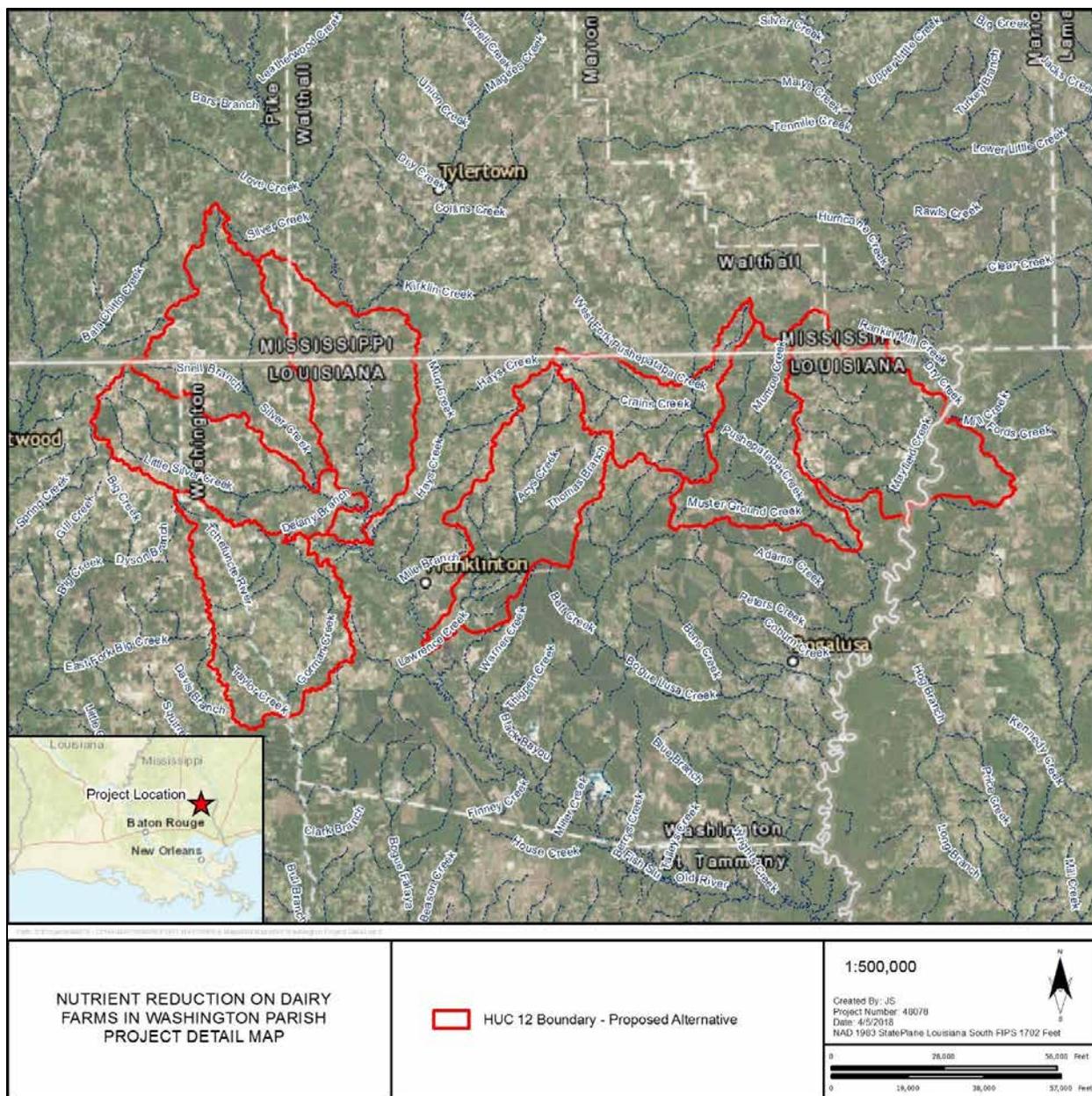


Figure 3.2-1b. Boundary for the Nutrient Reduction on Dairy Farms in Washington Parish alternative, Theme 1.

The following land cover classes are located within the alternatives’ watersheds, and Table 3.2-2 shows the breakdown by class and acres present within the alternative boundary. The alternatives would only target agricultural lands in these watersheds.

- Water: areas of open water, generally with less than 25% cover of vegetation or soil.
- Developed land: areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. These include parks, golf courses, single-family housing units, large-lot single-family housing units, apartment complexes, row houses, and commercial and industrial lots.

- Barren: areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits, and other accumulations of earthen material.
- Forest: areas where trees are generally greater than 5 meters tall and form greater than 20% of the total vegetation cover. Includes deciduous forest, evergreen forest, and mixed forest types.
- Shrubland: areas dominated by shrubs less than 5 meters tall and with shrub canopy typically greater than 20% of the total vegetation. This class includes tree shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.
- Herbaceous: areas where graminoid or herbaceous vegetation is greater than 80% of the total vegetation. These areas are not subject to intensive management such as tilling, but can be used for grazing.
- Planted/cultivated: areas where active agricultural practices occur, including growing pasture/hay and cultivated crop types. Pasture/hay is areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops typically on a perennial cycle. Cultivated crops are areas used for the production of annual crops and all areas being actively tilled.
- Wetlands: areas where soil or substrate is periodically saturated or covered with water. Includes woody wetlands and emergent herbaceous wetlands types.

Table 3.2-2. Land Use Category Acreage by Alternative

Land Use Category	Acres
Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes	
Water	37.49
Developed land	2,346.87
Barren	12.46
Forest	13,515.64
Shrubland	14,728.16
Herbaceous	882.79
Planted/cultivated	7,893.67
Wetlands	6,939.13
Nutrient Reduction on Dairy Farms in Washington Parish	
Water	1,700.88
Developed land	12,996.26
Barren	1,973.95
Forest	53,314.73
Shrubland	64,565.67
Herbaceous	6,826.19
Planted/cultivated	54,687.91
Wetlands	50,002.44

Source: Homer et al. (2015).

Implementing USDA-developed CPs have been successfully implemented to address natural resource concerns related to agricultural lands, and many of these practices can be used to achieve a number of the restoration types identified in the Final PDARP/PEIS. CPs are technical methods designed to help conserve soil, water, air, energy, and related plant and animal resources. Appendix D provides a list of CPs that would be available for implementation under the proposed Theme 1 alternatives. Two USDA CPs, 1) Diversion; and 2) Waste Separation Facility, are highlighted for the purposes of this RP/EA, to provide examples of the types of effects that may result from the application of different types of CPs. These effects are representative of some of the highest impact CPs; implementation of other CPs is anticipated to have lesser effects.

3.2.2.1.1 Diversion

A diversion is a channel generally constructed across a slope with a supporting ridge on the lower side. The purpose of a diversion is to break up concentrations of water on long slopes, on undulating land surfaces, and on land that is generally considered too flat or irregular for terracing. Diversions are used to divert water away from farmsteads, agricultural waste systems, or other improvements; collect or direct water for storage; protect terrace systems; intercept surface and shallow subsurface water flow; reduce runoff damages; divert water away from active gullies or critically eroding areas; and supplement water management on conservation cropping and stripcropping systems. Diversions are stable sloped channels which are vegetated to protect the diversion from erosion. Diversion capacity is dependent on what the water is being diverted away from. If the diversion is to protect agricultural lands, the minimum capacity is for the peak discharge from a 10-year frequency, 24-hour-duration storm, and if the diversion is to protect buildings, roads, and animal waste management systems, the minimum capacity is for the peak discharge from a 25-year frequency, 24-hour-duration storm.

3.2.2.1.2 Waste Separation Facility

A waste separation facility is a filtration or screening device, settling tank, settling basin, or settling channel used to partition solids and/or nutrients from a waste stream. The purpose of these facilities is to partition solids, liquids, and/or their associated nutrients to improve or protect air quality, water quality, improve manure-handling methods, or serve as a pre- or post-treatment for other processes. Facilities generally include waste collection points, waste transfer pipelines, and waste treatment and storage facilities. Waste separators can be either mechanical or non-mechanical and are selected based on site-specific characteristics to meet specific management objectives. For proper functioning of mechanical separation equipment, environmental conditions may require roofing and or building enclosures. For separation facilities exposed to precipitation events, emergency overflow appurtenances are designed to pass the peak runoff from the drainage area of the facility for a 25-year, 24-hour-duration storm plus the normal waste stream discharge. Design of settling basins is dependent on multiple factors including the amount of storage needed, equipment access needed for cleanout, appropriate ventilation if the facility is enclosed or in a confined area, and if the bottom is concrete or lined with a geosynthetic or geomembrane liner or is just compacted soil.

3.2.2.2 OIL POLLUTION ACT EVALUATION

This section provides the OPA evaluation for the nutrient reduction alternatives on dairy farms. If the alternatives under Theme 1 are selected, USDA would be the lead Implementing Trustee for the alternative working with other trustees as partners. The implementation of CPs under these alternatives would be dependent on willing landowners and successful conservation planning to implement those actions.

3.2.2.2.1 Cost Effectiveness

The cost of \$1.5 million per alternative for the development and implementation of conservation plans and practices in the Lake Pontchartrain Basin is reasonable for the alternatives (Table 3.2-3). The restoration approaches proposed by USDA to reduce nutrient loads from agricultural lands under Theme 1 have been applied extensively across the country, and the costs are well documented and reasonable (USDA 2014). USDA would implement the alternatives under Theme 1 by helping landowners voluntarily implement CPs that reduce nutrient runoff. The conservation planning, practice implementation, and monitoring costs represent best estimates from USDA and are consistent with previously implemented programs.

Table 3.2-3. Alternative and Associated Cost

Alternative Name	Cost
Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes	\$1,500,000.00
Nutrient Reduction on Dairy Farms in Washington Parish	\$1,500,000.00

This funding would not be used to fund previous activities required under local, state, or federal law (e.g., pollution reduction actions required by a Clean Water Act [CWA] permit), but instead could be used in coordination with existing mandates to enhance water quality benefits. Through a coordinated and integrated watershed approach to project implementation, expected benefits include reductions in nutrient losses from the landscape; reductions in nutrient loads and fecal coliform bacteria to streams and downstream receiving waters; reduction in water quality degradation (e.g., hypoxia and harmful algal blooms); and associated benefits to coastal waters, habitats, and resources. The LA TIG anticipates that the alternatives would result in improved water quality by reducing nutrient runoff into coastal waters.

3.2.2.2.2 Trustee Restoration Goals and Objectives

Each of the nutrient reduction on dairy farms alternatives under Theme 1 has a clear nexus to the injuries described in the Final PDARP/PEIS because implementation of CPs on agricultural lands would reduce nutrient enrichment and levels of fecal coliform bacteria to help restore water quality in Gulf of Mexico coastal watersheds. The health of the Gulf of Mexico depends upon the health of its estuaries, and the health of those coastal waters is influenced by land use upstream along tributary rivers. The primary goal for alternatives under Theme 1 is water quality improvement through the Nutrient Reduction (Nonpoint Source) restoration type. This watershed-scale approach restores water quality impacted by the DWH Oil Spill by reducing the levels of nutrients and fecal coliform bacteria that enter the Gulf of Mexico. Runoff from agricultural lands contributes nutrients that adversely impact the health of coastal waters. The proposed CPs (see Appendix D) would reduce nutrient losses from the landscape; reduce nutrient and fecal coliform bacteria loads to streams and downstream receiving waters; and reduce water quality degradation in watersheds that would provide benefits to marine resources and coastal watersheds.

3.2.2.2.3 Likelihood of Success

USDA has demonstrated success in developing and implementing the same types of CPs in the watersheds targeted by the alternatives and other similar watersheds. Given their extensive experience and expertise in CPs, the success and legacy of USDA conservation programs, and their established level of trust and cooperation with private landowners, there is a significant opportunity to implement CPs on private lands that would reduce the levels of nutrients entering watersheds that could provide benefits to marine resources and coastal watersheds.

Examples of past successful water quality restoration projects include regional watershed management plans, state CWA 319 programs, and USDA conservation programs (i.e., EQIP, Conservation Reserve Program [CRP], Wetlands Reserve Program [WRP], and Wildlife Habitat Incentives Program [WHIP]). Additionally, USDA conservation programs and EPA have funded the successful implementation of agriculture CPs throughout the nation, resulting in significant reductions in nutrient loadings to water bodies nationwide (Soil and Water Conservation Society & Environmental Defense [SWCS and ED] 2007). Recently, USDA's Conservation Effects Assessment Program (CEAP) evaluated the ecological impact of the agricultural CPs implemented in the Texas Gulf Basin (NRCS 2015). These practices combine structural practices for controlling water erosion with structural or tillage and residue management practices to reduce nutrient runoff throughout the Texas Gulf Basin. The combined use of these CPs has reduced sediment, nitrogen, and phosphorus loads delivered from cropland to rivers and streams by 60%, 41%, and 55%, respectively (NRCS 2015). Additionally, under Section 319 of the CWA, EPA provides grants to states that work with partners and stakeholders to control nonpoint source pollution. The Section 319 program has documented numerous examples of the use of conservation systems, or a combination of CPs used to address a specific resource concern, to restore water quality.

3.2.2.2.4 Prevention of Future Injury and Avoid Collateral Injury

USDA has applied CPs according to standards that require use of associated and mitigating practices in a “systems approach” to ensure new injuries do not occur and those practice standards would be followed under each proposed nutrient reduction on dairy farms alternative. In addition, the LA TIG would ensure compliance with all applicable federal laws, regulations, and executive orders prior to implementation of the selected alternative by using a site-specific environmental evaluation process carried out during the conservation planning effort. This process would include conducting any necessary agency consultations and obtaining any required permits. Among other things, the environmental evaluation would identify mitigation measures needed and determine whether there is potential for significant adverse effects to be created. If such potential exists, that particular alternative would be abandoned or redesigned to minimize the impacts. The LA TIG does not anticipate implementing any actions with the potential for significant adverse effects. The alternatives would meet all the OPA and NEPA requirements as discussed in Sections 3 and 4 of this RP/EA.

3.2.2.2.5 Benefits to Multiple Resources

Under the Theme 1 alternatives, various CPs would be conducted on private lands to address nutrient reduction. Through a coordinated and integrated watershed approach to alternative implementation, benefits to multiple resources are anticipated from reductions in nutrient losses from the landscape and the resulting reductions in nutrient and fecal coliform bacteria loads to streams and downstream receiving waters; this would provide benefits to recreational users as well as marine resources.

3.2.2.2.6 Public Health and Safety

Participation in the conservation programs is voluntary and would be completed on private land under the guidance of USDA. There would be beneficial impacts to water quality in the watershed, which reduces risks to public health and safety. In addition, appropriate safety measures would be followed during CP design and implementation.

3.2.2.2.7 Alternative Evaluation Summary

The restoration approach “reduce nutrient loads to coastal watersheds” meets the criteria for being appropriate under OPA. If implemented properly, this approach would enhance ecosystem services provided by restored habitats and resources and may return injured natural resources and services to

baseline conditions by 1) reducing nutrient loads to coastal watersheds, 2) improving water quality, 3) reducing the extent of eutrophication and occurrence of low dissolved oxygen and/or harmful algal blooms, 4) reducing turbidity, and 5) increasing light penetration. Additionally, this approach can work to compensate for interim losses to estuarine-dependent water column resources, oysters, submerged aquatic vegetation, and recreational uses adversely affected by the DWH Oil Spill. The restoration approach may compensate for lost ecosystem services by reducing nutrient runoff, which would improve water quality and mitigate chronic ecosystem threats (e.g., hypoxia, harmful algal blooms, and impaired recreational use) to provide ecosystem benefits to injured resources and habitats. The experience of USDA with the CPs under Theme 1 ensures they will be implemented successfully, will be cost effective, and will have a high likelihood of success. Additionally, nutrient reduction benefits multiple resources (water quality, flora and fauna, recreational uses dependent on higher functioning waters, etc.). In the unlikely event a CP is determined to have potential for collateral injury at a given location, it would be abandoned.

3.2.3 Theme 2. Nutrient Reduction on Cropland and Grazing Land

Alternatives under Theme 2 are as follows:

- Nutrient Reduction on Cropland and Grazing Land in Bayou Fosse
- Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes
- Nutrient Reduction on Cropland and Grazing Land in Iberia, St. Mary, and Vermilion Parishes

3.2.3.1 ALTERNATIVE DESCRIPTION

Runoff containing fertilizers and livestock waste from agricultural lands in the Atchafalaya, Mermentau, Vermilion-Teche, Mississippi, Red, Ouachita, Barataria, and Terrebonne River Basins is a significant contributor to nitrogen and phosphorus levels within these watersheds. The deposition of excessive nutrients in these watersheds stimulates an overgrowth of algae that sinks and decomposes in the water downstream. The resulting low oxygen levels are insufficient to support most aquatic life and habitats in near-bottom waters, posing a serious threat to the Gulf of Mexico's fisheries. Because of the particular hydrology of these basins, these nutrient loads have a direct flow path to the Gulf of Mexico. The annual hypoxic zone that forms in nearshore waters off the Louisiana coast is a chronic problem with significant implications for the health of Gulf of Mexico resources, and this threat to the long-term health of those resources requires addressing the problem. This creates opportunities to address this resource concern in cropland and grazing land within these watersheds that are located within Concordia, Catahoula, Tensas, Lafourche, Terrebonne, Iberia, St. Mary, and Vermilion Parishes.

Given the success of USDA conservation programs such as EQIP and their strong acceptance by landowners, there is a significant opportunity to implement CPs on cropland and grazing land that would reduce the levels of nutrients entering the Gulf of Mexico. The primary goal of Theme 2 alternatives is to enhance overall ecosystem health by benefitting the estuaries that are integral habitat for many of the Gulf of Mexico's ecologically and economically important species. Many estuarine-dependent species spend part of their life history offshore, and therefore, there is a strong linkage between the health of inshore and offshore waters. Nutrients originating from cropland and grazing land can enter water bodies through runoff and have a considerable deleterious effect on water quality. Nutrient management planning and implementation of BMPs/CPs on cropland and grazing land can improve water quality for not only the receiving water body, but downstream as well.

Conservation on agricultural lands normally begins with a complete operational and natural resource assessment, conducted with the landowner's plans and objectives in mind, while striving to address existing water quality concerns associated with the operation. Ultimately, conservation concerns and

objectives are addressed by developing a CNMP, which would be used to define all CP design parameters. Nutrient reduction on cropland and grazing land alternatives would target efforts to achieve a measurable impact by clustering projects in HUC 12 watersheds that directly impacts coastal wetlands (Figure 3.2-2). The identified HUC 12s are located within multiple parishes under Theme 2 (Table 3.2-4). Activities associated with alternatives under Theme 2 would occur on private lands on a voluntary basis.

Table 3.2-4. Hydrologic Unit Code 12 Watershed by Alternative

Nutrient Reduction on Cropland and Grazing Land in Bayou Fosse	
Bayou Cutoff	Lake Fields
Halpin Canal	Bayou Terrebonne
Bayou L'Eau Bleu	St. Louis Cana-Bayou Pointe Au Chien
Forty Arpent Canal	
Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes	
Ford Creek	Wyches Bayou-Bayou Cocodrie
Crackets Bayou	Pool Lake Bayou
Little Choctaw Bayou-Big Choctaw Bayou	Cross Bayou
Excelsior Lake-Bayou Cocodrie	Callahan Branch-Ouachita River
Boggy Bayou-Fool River	Cocodrie Lake
Routh Bayou-Big Choctaw Bayou	Hawthorne Creek-Bushley Creek
Haha Bayou	Black Bayou
Black Bayou-Tensas River	Vidalia Canal-Bayou Cocodrie
Lake St. John-Black Bayou Lake	Greens Bayou
Hibbs Bayou	Lake Concordia-Bayou Cocodrie
Little Tensas Bayou-Little Tensas River	Dean Bayou-Tensas River
Dismal Swamp-Bayou Cocodrie	Glade Bayou-Black River
Big Choctaw Bayou-Tensas Lake	Boggy Bayou
Van Buren Bayou	Lake Louis-Bayou Louis
Clarks Bayou-Bayou Macon	Brushy Bayou
Durham Prong	Long Branch
Birds Creek-Sandy Lake	Lake St. Joseph-Clark Bayou
Lake Bruin	Whites Bayou-Bayou Cocodrie
Elm Slough-Little River	Tiger Bayou
Brushley Bayou-Ouachita River	Big Cash Bayou-Tensas River
Black River Lake-Black River	
Nutrient Reduction on Cropland and Grazing Land in Iberia, St. Mary, and Vermilion Parishes	
Yokely Bayou-Frontal Intercoastal Waterway	Blackfish Pirogue Trail-Frontal White Lake
Schooner Bayou Canal-Frontal White Lake	Bayou Grand Marais
Sledge Canal-Frontal Intercoastal Waterway	Warren Canal-Frontal Intercoastal Waterway
Bayou Cypremort-Frontal Intercoastal Waterway	Oyster Bayou-Frontal Gulf of Mexico
Loreauville Canal-Bayou Teche	Bayou Tigre-Delcambre Canal
Freshwater Bayou-Frontal Gulf of Mexico	Big Way Bayou-Frontal Atchafalaya Bay

Nutrient Reduction on Cropland and Grazing Land in Bayou Folse	
Bayou Lucien-Frontal Gulf of Mexico	Bayou Carlin-Frontal Cote Blanche Bay
Deblane Coulee-Bayou Petite Anse	Youngs South Coulee-Vermilion River
Delahoussaye Canal	Yellow Bayou-Bayou Teche
Pecan Island-Frontal Gulf of Mexico	Tete Bayou
Bayou Teche-Lower Atchafalaya River	East Constance Bayou- Frontal Gulf of Mexico
Isle Marrone Canal-Frontal Intercoastal Waterway	Vermilion River-Frontal Intercoastal Waterway
Bayou Cypermort-Frontal Vermilion Bay	Lake Fausee Point
Pipeline Canal-Frontal Gulf of Mexico	Grosse Isle Point-Frontal Gulf of Mexico
Bayou Carlin-Frontal Intercoastal Waterway	Warren Canal-Schooner Bayou Canal
Little Bayou-Vermilion River	Bayou Pare Perdu-Lake Peigneur
Bayou Choupique-Frontal Intercoastal Waterway	Belle Isle Bayou-Freshwater Bayou Canal
Seventh Ward Canal-Frontal Intercoastal Waterway	Boston Canal-Frontal Intercoastal Waterway
Wax Lake	Shell Reefs-Frontal Gulf of Mexico
Coulee Kenny	Lower Atchafalaya River-Frontal Atchafalaya Bay
Latanier Bayou-Frontal Intercoastal Waterway	Bayou Blanc-Frontal West Cote Blanche Bay
Weeks Bayou-Frontal Intercoastal Waterway	Hog Bayou-Frontal Wax Lake
Vermilion River-Frontal Vermilion Bay	Billy Bayou-Frontal Intercoastal Waterway
Floating Turf Bayou-Frontal White Lake	Florence Canal-Frontal White Lake

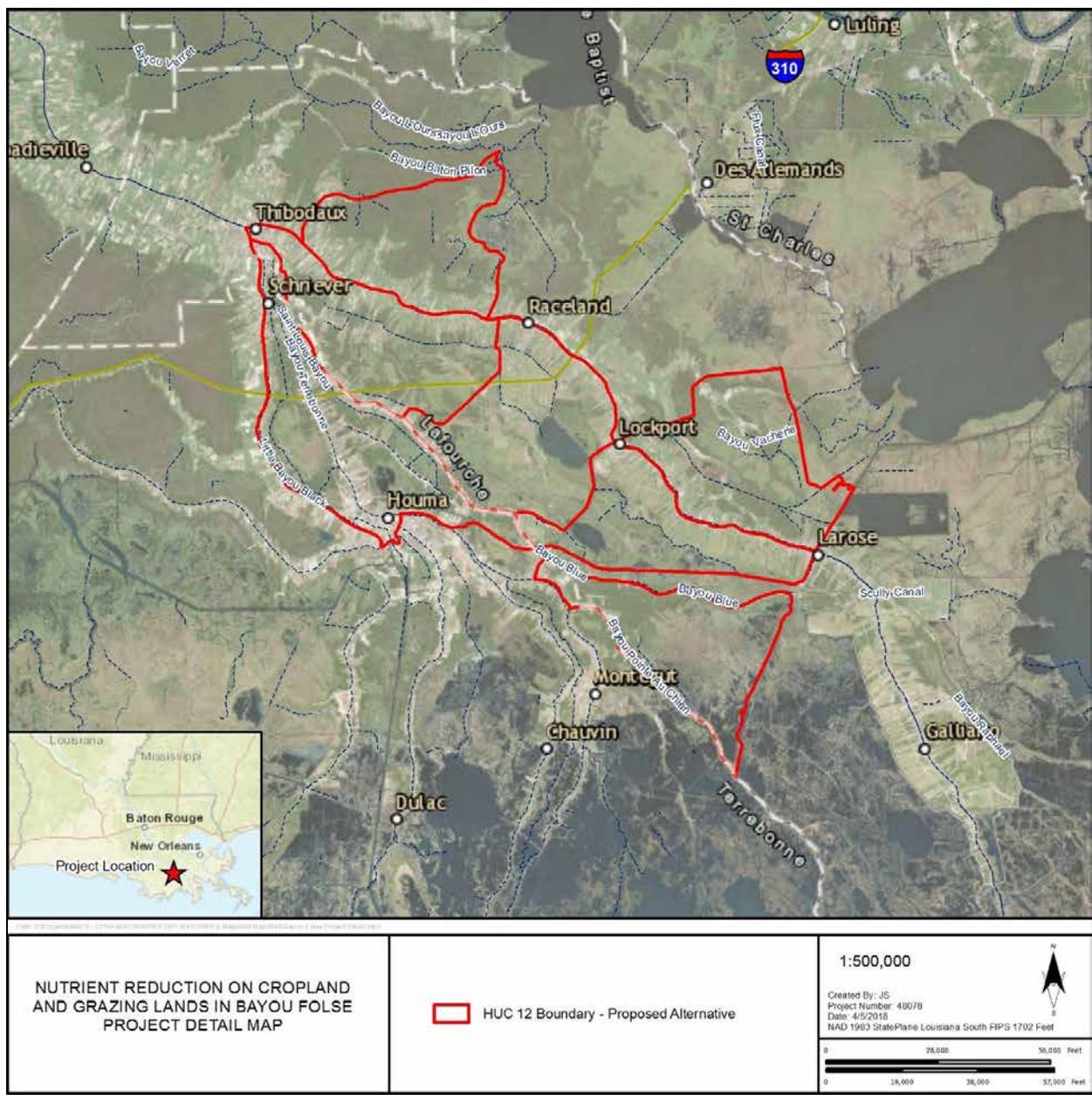


Figure 3.2-2a. Boundary for the Nutrient Reduction on Cropland and Grazing Land in Bayou Folse alternative, Theme 2.

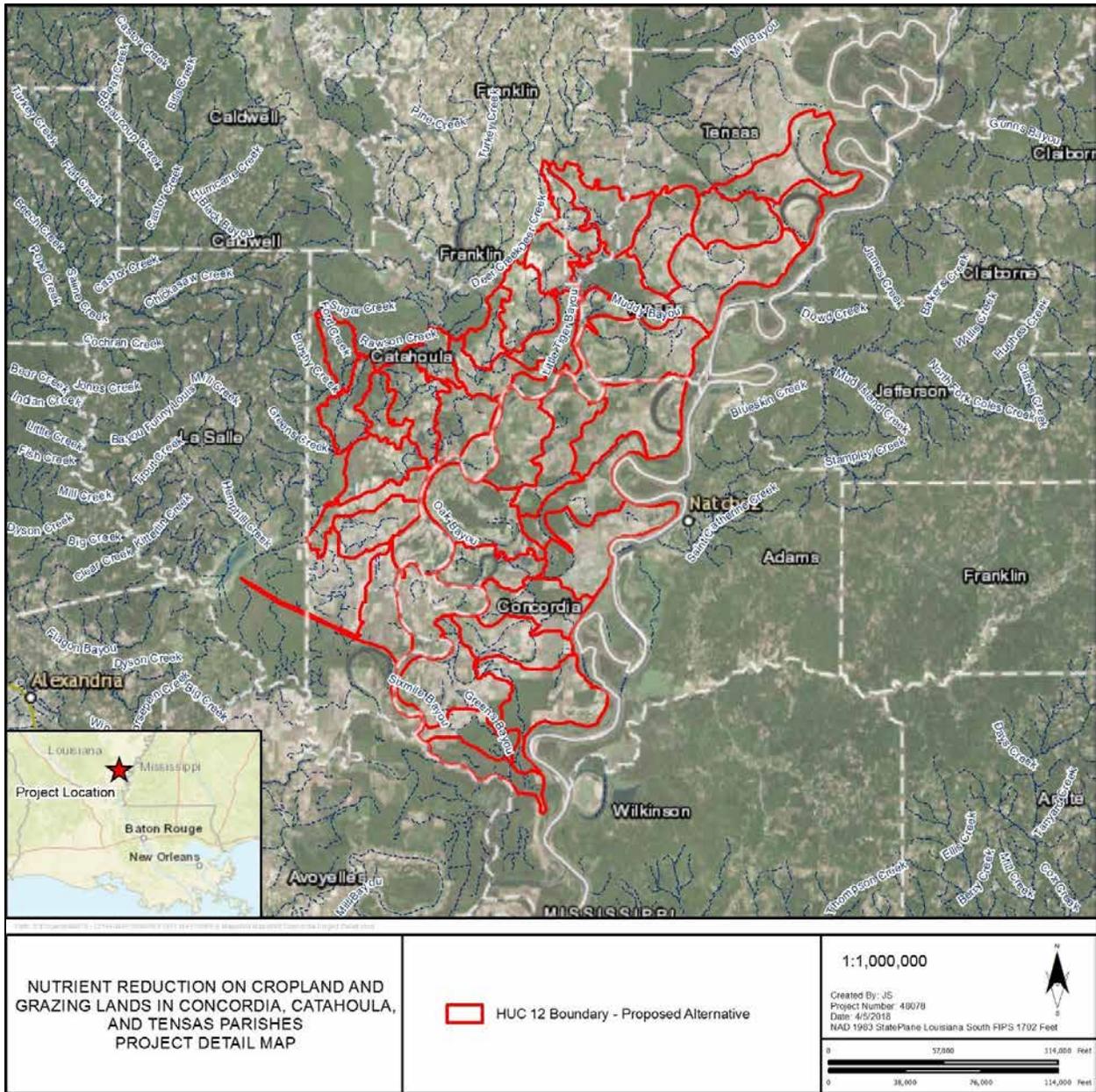


Figure 3.2-2b. Boundary for the Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes alternative, Theme 2.

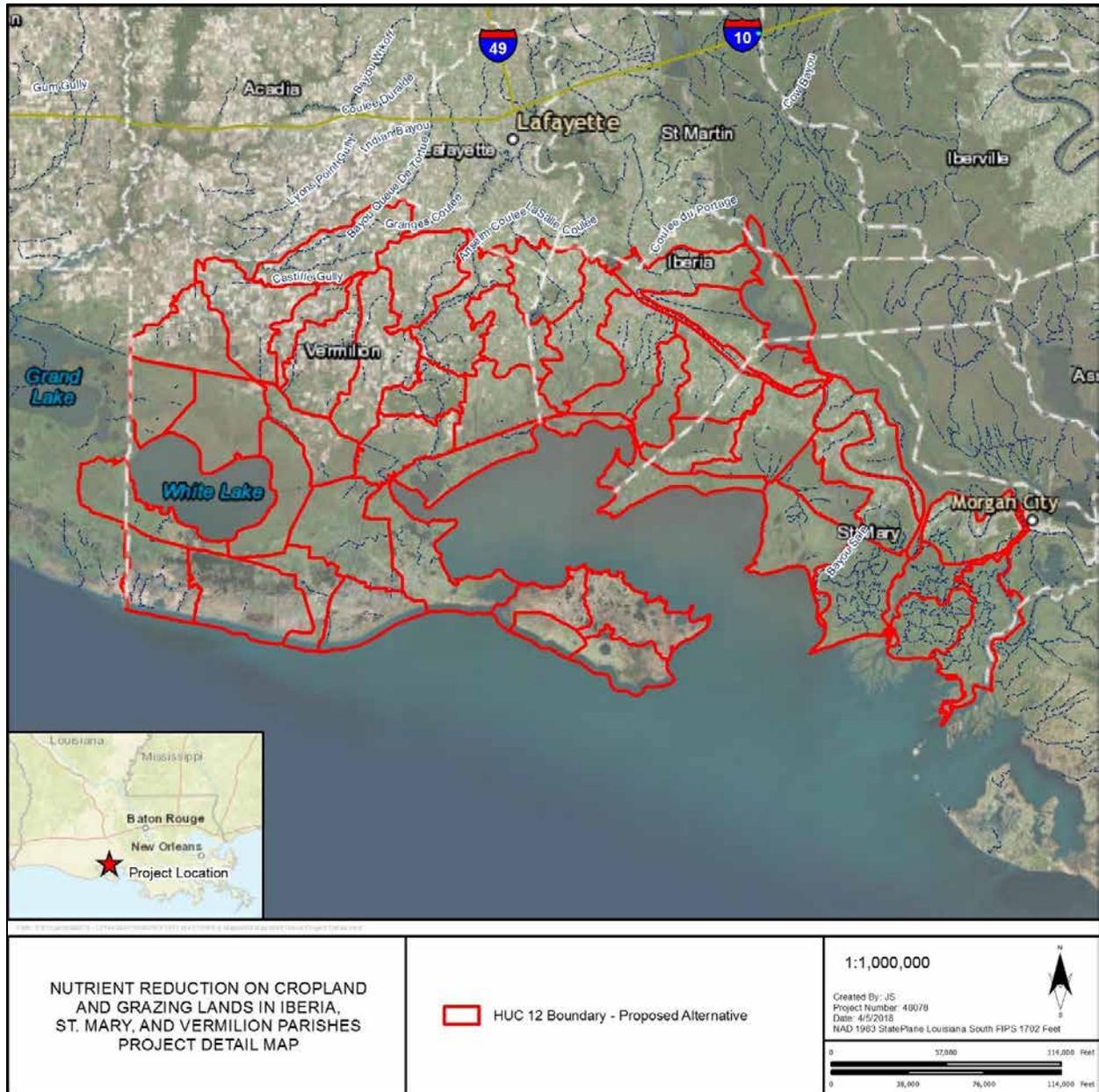


Figure 3.2-2c. Boundary for the Nutrient Reduction on Cropland and Grazing Land in Iberia, St. Mary, and Vermilion Parishes alternative, Theme 2.

The following land cover classes are located within the watershed of each alternative, and Table 3.2-5 shows the breakdown by class and acres present within each alternative’s boundaries. The alternatives would only target agricultural lands within these watersheds.

- Water: areas of open water, generally with less than 25% cover of vegetation or soil.
- Developed land: areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. These include parks, golf course, single-family housing units, large-lot single-family housing units, apartment complexes, row houses, and commercial and industrial lots.
- Barren: areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material.
- Forest: areas where trees are generally greater than 5 meters tall and form greater than 20% of the total vegetation cover. Includes deciduous forest, evergreen forest, and mixed forest types.
- Shrubland: areas dominated by shrubs less than 5 meters tall and with shrub canopy typically greater than 20% of the total vegetation. This class includes tree shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.
- Herbaceous: areas where graminoid or herbaceous vegetation are greater than 80% of the total vegetation. These areas are not subject to intensive management such as tilling, but can be used for grazing.
- Planted/cultivated: areas where active agricultural practices occur, including growing pasture/hay and cultivated crop types. Pasture/hay is areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops typically on a perennial cycle. Cultivated crops are areas used for the production of annual crops and all areas being actively tilled.
- Wetlands: areas where soil or substrate is periodically saturated or covered with water. Includes woody wetlands and emergent herbaceous wetlands types.

Table 3.2-5. Land Use Category Acreage by Alternative

Land Use Category	Acres
Nutrient Reduction on Cropland and Grazing Land in Bayou Fosse	
Water	10,033.99
Developed land	24,548.06
Barren	324.71
Forest	393.99
Shrubland	1,217.54
Herbaceous	637.92
Planted/cultivated	59,958.58
Wetlands	123,181.51
Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes	
Water	31,523.39
Developed land	40,312.66
Barren	102.74
Forest	47,174.61
Shrubland	5,465.43
Herbaceous	2,229.49
Planted/cultivated	551,170.36
Wetlands	212,818.22

Land Use Category	Acres
Nutrient Reduction on Cropland and Grazing Land in Iberia, St. Mary, and Vermilion Parishes	
Water	134,805.81
Developed land	75,201.58
Barren	11,305.46
Forest	7,428.53
Shrubland	4,152.25
Herbaceous	4,412.63
Planted/cultivated	476,832.03
Wetlands	719,722.56

Source: Homer et al. (2015).

USDA-developed CPs have been successfully implemented to address natural resource concerns related to agricultural lands, and many of these practices can be used to achieve a number of the restoration types identified in the Final PDARP/PEIS. CPs are technical methods designed to help conserve soil, water, air, energy, and related plant and animal resources. Appendix D provides a list of CPs that would be available for implementation under the proposed Theme 2 alternatives. Two USDA CPs, 1) Residue and Tillage Management, Reduced Till and 2) Grassed Waterway, are highlighted for the purposes of this RP/EA, to provide examples of the types of effects that may result from the application of different types of CPs. These effects are representative of some of the highest impact CPs; implementation of other CPs is anticipated to have lesser effects.

3.2.3.1.1 Residue and Tillage Management, Reduced Till

Residue management is managing the amount, orientation, and distribution of crop and other plant residue on the soil surface throughout the year. It includes all soil disturbing activities like tillage, nutrient applications, and harvesting of residue. Residue management systems can be designated to accomplish multiple purposes including: reduce sheet and rill erosion, maintain or increase soil organic matter, increase moisture available for plant use, reduce energy use, reduce soil particulate emissions and carbon dioxide (CO₂) losses, and provide food and escape cover for wildlife. Residue tillage regimes manage residue for sustainable agricultural production, which have been proven to improve soil condition over traditional tillage methods. Reduced till systems manage the amount, orientation, and distribution of crop and other residue on the soil surface while limiting the soil disturbing activities used to grow and harvest crops in systems where the field surface is tilled prior to planting.

3.2.3.1.2 Grassed Waterway

A grassed waterway is a shaped or graded channel that is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. The purpose of a grassed waterway is to convey runoff from terraces, diversions, or other water concentrations without causing erosion or flooding, to reduce gully erosion, and/or to protect and improve water quality. Design features of grassed waterways include capacity, stability, width, side-slope depth, drainage, outlets, and vegetative establishment.

3.2.3.2 OIL POLLUTION ACT EVALUATION

This section provides the OPA evaluation for the nutrient reduction alternatives on cropland and grazing land. If the alternatives under Theme 2 are selected, USDA would be the lead Implementing Trustee for the alternative, working with other Trustees as partners. The implementation of CPs under these

alternatives would be dependent on willing landowners and successful conservation planning to implement those actions.

3.2.3.2.1 Cost Effectiveness

The cost for the development and implementation of conservation plans and practices is reasonable for the alternatives (Table 3.2-6). The restoration approaches proposed by USDA to reduce nutrient loads from agricultural lands under Theme 2 have been applied extensively across the country, and the costs are well documented and reasonable (USDA 2014). USDA would implement the alternatives under Theme 2 by helping landowners voluntarily implement CPs that reduce nutrient runoff. The conservation planning, practice implementation, and monitoring costs represent best estimates from USDA and are consistent with previously implemented programs.

Table 3.2-6. Alternative and Associated Cost

Alternative Name	Cost
Nutrient Reduction on Cropland and Grazing Land in Bayou Folsé	\$3,000,000.00
Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes	\$1,500,000.00
Nutrient Reduction on Cropland and Grazing Land in Iberia, St. Mary, and Vermilion Parishes	\$1,500,000.00

This funding would not be used to fund previous activities required under local, state, or federal law (e.g., pollution reduction actions required by a CWA permit), but instead could be used in coordination with existing mandates to enhance water quality benefits. Through a coordinated and integrated watershed approach to project implementation, expected benefits include reductions in nutrient losses from the landscape; reductions in nutrient loads to streams and downstream receiving waters; reduction in water quality degradation (e.g., hypoxia and harmful algal blooms); and associated benefits to coastal waters, habitats, and resources. The LA TIG anticipates that the alternatives would result in improved water quality by reducing nutrient runoff into coastal waters.

3.2.3.2.2 Trustee Restoration Goals and Objectives

The alternatives under Theme 2 have a clear nexus to the nutrient reduction injuries described in the Final PDARP/PEIS because implementation of CPs on agricultural lands would reduce nutrient enrichment and restore water quality in Gulf of Mexico coastal watersheds. The health of the Gulf of Mexico depends upon the health of its estuaries, and the health of those coastal waters is influenced by land use upstream along tributary rivers. The primary goal of the alternatives under Theme 2 is water quality improvement through the Nutrient Reduction (Nonpoint Source) restoration type. These watershed-scale alternatives restore water quality impacted by the DWH Oil Spill by reducing runoff from agricultural lands that contribute nutrients that adversely impact the health of coastal waters and the Gulf of Mexico. The proposed CPs (see Appendix D) would reduce nutrient losses from the landscape, reduce nutrient loads to streams and downstream receiving waters, and reduce water quality degradation in watersheds that would provide benefits to marine resources and coastal watersheds. These alternatives are also congruent with the goals of the *Gulf Hypoxia Action Plan* (Mississippi River Gulf of Mexico Watershed Nutrient Task Force 2008) and *Gulf Hypoxia Action Plan Reassessment* (Reassessment) (Mississippi River Gulf of Mexico Watershed Nutrient Task Force 2013) by reducing nutrient loading from cropland and grazing land in key source watersheds.

3.2.3.2.3 Likelihood of Success

USDA has demonstrated success in developing and implementing the same types of CPs in watersheds targeted by the alternatives and other similar watersheds. Given their extensive experience and expertise in CPs, the success and legacy of USDA conservation programs, and their established level of trust and

cooperation with landowners, there is a significant opportunity to implement CPs on private lands. These implemented CPs would reduce the levels of nutrients entering watersheds that could provide benefits to marine resources and coastal watersheds.

Examples of past successful water quality restoration projects include regional watershed management plans, state CWA 319 programs, and USDA conservation programs (i.e., EQIP, CRP, WRP, and WHIP). Additionally, USDA conservation programs and EPA have funded the successful implementation of agricultural CPs throughout the nation, resulting in significant reductions in nutrient loadings to water bodies nationwide (SWCS and ED 2007). Recently, USDA's CEAP evaluated the ecological impact of the agricultural CPs implemented in the Texas Gulf Basin (NRCS 2015). These practices combine structural practices for controlling water erosion with structural or tillage and residue management practices to reduce nutrient runoff throughout the Texas Gulf Basin. The combined use of these CPs has reduced sediment, nitrogen, and phosphorus loads delivered from cropland to rivers and streams by 60%, 41%, and 55%, respectively (NRCS 2015). Additionally, under Section 319 of the CWA, EPA provides grants to states that work with partners and stakeholders to control nonpoint source pollution. The Section 319 program has documented numerous examples of the use of conservation systems, or a combination of CPs used to address a specific resource concern, to restore water quality.

3.2.3.2.4 Prevention of Future Injury and Avoid Collateral Injury

USDA has applied CPs according to standards that require use of associated and mitigating practices in a “systems approach” to ensure new injuries do not occur and those practice standards would be followed under each Theme 2 alternative. In addition, the LA TIG would ensure compliance with all applicable federal laws, regulations, and executive orders prior to implementation of the selected alternative by using a site-specific environmental evaluation process carried out during the conservation planning effort. This process would include conducting any necessary agency consultations and obtaining any required permits. Among other things, the environmental evaluation would identify mitigation measures needed and determine whether there is potential for significant adverse effects to be created. If such potential exists, that particular alternative would be abandoned or redesigned to minimize the impacts. The LA TIG does not anticipate implementing any actions with potential for significant adverse effects. The alternatives would meet all the OPA and NEPA requirements as discussed in Sections 3 and 4 of this RP/EA.

3.2.3.2.5 Benefits to Multiple Resources

Under the Theme 2 alternatives, various CPs would be conducted on private lands to address nutrient reduction. Through a coordinated and integrated watershed approach to alternative implementation, benefits to multiple resources are anticipated from reductions in nutrient losses from the landscape and the resulting reductions in nutrient loads to streams and downstream receiving waters; this would provide benefits to recreational uses as well as marine resources and coastal watersheds.

3.2.3.2.6 Public Health and Safety

Participation in the conservation programs is voluntary and would be completed on private land under the guidance of USDA. There would be beneficial impacts to water quality in the watershed, which reduces risks to public health and safety. In addition, appropriate safety measures would be followed during CP design and implementation.

3.2.3.2.7 Alternative Evaluation Summary

The restoration approach “reduce nutrient loads to coastal watersheds” meets the criteria for being appropriate under OPA. If implemented properly, this approach would enhance ecosystem services

provided by restored habitats and resources and may return injured natural resources and services to baseline conditions by 1) reducing nutrient loads to coastal watersheds, 2) improving water quality, 3) reducing the extent of eutrophication and occurrence of low dissolved oxygen and/or harmful algal blooms, 4) reducing turbidity, and 5) increasing light penetration. Additionally, this approach can work to compensate for interim losses to estuarine-dependent water column resources, oysters, submerged aquatic vegetation, and recreational uses adversely affected by the DWH Oil Spill. The restoration approach may compensate for lost ecosystem services by reducing nutrient runoff, which would improve water quality and mitigate chronic ecosystem threats (e.g., hypoxia, harmful algal blooms, and impaired recreational use) to provide ecosystem benefits to injured resources and habitats. The experience of USDA with the CPs under Theme 2 ensures they will be implemented successfully, will be cost effective, and will have a high likelihood of success. Additionally, nutrient reduction benefits multiple resources (water quality, flora and fauna, recreational uses dependent on higher functioning waters, etc.). In the unlikely event the CP is determined to have potential for collateral injury at a given location, it would be abandoned.

3.2.4 Theme 3. Winter Water Holding on Cropland

Alternatives under Theme 3 are as follows:

- Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices
- Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes
- Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes

3.2.4.1 ALTERNATIVE DESCRIPTION

Louisiana includes some of the most diverse and intensively used agricultural land in the Gulf South, and the use of winter water holding CPs can assist in improving water quality in the Gulf of Mexico. Winter water holding for nutrient management on agricultural lands can allow the filtering of nutrients and sediment prior to water release into the watersheds. These projects also create a diversity of habitats for waterfowl, wading bird, shorebird, invertebrate, and other species that require shallow water areas during part of their life cycle.

Winter water holding requires retention of irrigation water over the fall/winter, usually from October through March, or other specified periods of time as desired, for the purpose of improving water quality and the creation of wildlife habitat. Croplands currently in rice production with levee and irrigation systems in place, as well as fallow fields formerly planted with rice, but that are currently grazed continuously or intermittently and retain the original levee with irrigation systems would be targeted for alternatives under Theme 3. The retained water allows for sediment deposition, nutrient uptake by emergent aquatic vegetation, use of the previous planting year's crop residue to reduce soil disturbance from wind-induced water movement, and animal feeding activity. De-watering is done in 1- to 2-inch increments to prevent erosive current velocity, prevent nutrient/bacteria loading in receiving water bodies, provide wildlife habitat, and to enhance native vegetation density and diversity. Levels of nutrients and suspended sediments in impounded or retained water would be assessed prior to de-watering, which provides improvements to water quality downstream.

Given the success of USDA conservation programs such as EQIP and their strong acceptance by private landowners, there is a significant opportunity to implement CPs for winter water holding on cropland that would reduce the levels of nutrients and fecal coliform bacteria entering the Gulf of Mexico and create

and/or enhance wildlife habitats. The primary goal of these alternatives is to enhance overall ecosystem health by benefitting the estuaries that are integral habitat for many of the Gulf of Mexico’s ecologically and economically important species. Cropland in Louisiana can have a considerable negative effect on water quality. Nutrients originating from cropland can enter water bodies through runoff. Winter water holding management and implementation of BMPs/CPs on cropland can improve water quality for the receiving water body and the downstream water bodies.

Conservation on agricultural lands normally begins with a complete operational and natural resource assessment, conducted with the operator’s plans and objectives in mind, while striving to address existing water quality concerns associated with the operation. All enrolled agricultural land tracts would be included in development of a CNMP, which would be used to define all CP design parameters.

The proposed winter water holding on cropland alternatives would target efforts for measurable impact by clustering projects at the HUC 12 watershed scale that directly impacts coastal wetlands (Figure 3.2-3). The identified HUC 12s are located within multiple parishes, and alternatives under Theme 3 are identified by the parishes in which priority HUCs are located (Table 3.2-7). Activities associated with alternatives under Theme 3 would occur on private lands on a voluntary basis.

Table 3.2-7. Hydrologic Unit Code 12 Watershed by Alternative

Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices	
Bayou Misere-Frontal Grand Lake	Collicon Lake-Frontal Grand Lake
Catfish Bayou-Frontal Grand Lake	Warren Canal-Schooner Bayou Canal
Belle Isle Bayou-Freshwater Bayou Canal	Sledge Canal-Frontal Intercoastal Waterway
Isle Marrone Canal-Frontal Intercoastal Waterway	Seventh Ward Canal-Frontal Intercoastal Waterway
Maple Marsh-Frontal Intercoastal Waterway	Cameron Canal-Frontal Intercoastal Waterway
Latanier Bayou-Frontal Intercoastal Waterway	Warren Canal-Intercoastal Waterway
Blackfish Pirouge Trail-Frontal White Lake	Florence Canal-Frontal White Lake
Schooner Bayou Canal-Frontal White Lake	Floating Turf Bayou-Frontal White Lake
Thornwell Drainage Canal-Bayou Lacassine	Lake Arthur
Little Pecan Bayou	Hog Bayou-Frontal Gulf of Mexico
Upper Mud Lake-Mermentau River	Pecan Island-Frontal Gulf of Mexico
Pipeline Canal-Frontal Gulf of Mexico	Little Pecan Canal
Headquarters Canal-Frontal Gulf of Mexico	Constance Bayou-Frontal Gulf of Mexico
East Constance Bayou-Frontal of Gulf of Mexico	Little Bayou-Vermilion River
Vermilion River-Frontal Intercoastal Waterway	
Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes	
Bayou Chicot-Lake Chicot	West Fork-Bayou Plaquemine Brule
Bayou Grand Marais	Francois Coulee-Vermilion River
Little Bayou	Bayou Jonas
Bayou Duralde-Bayou Nezpique	Millers Lake-East Fork Bayou Nezpique
Bayou Petite Passe	Bayou Cypermort-Frontal Intercoastal Waterway
Bayou Wikoff-Roberts Cove	Loreauville Canal-Bayou Teche
Bayou Tigre-Delcambre Canal	Mitchell Creek-Castor Creek

Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices	
Jennings Norwood Canal-Bayou Nezpique	Coulee Ile Des Cannes
Bayou Carencro	Bayou Courtableau-Bayou Toulouse
Bayou Pointe Aux Loups-Bayou Des Cannes	Bayou Cocodrie-Elm Bayou
Indian Bayou Canal	Mountain Bayou Lake-Bayou Cocodrie
Deblane Coulee-Bayou Petite Anse	Caney Creek-Castor Creek
Indian Bayou-Bayou Queue De Tortue	Reeves Creek-Calcasieu River
Kinder Ditch-Calcasieu River	Bayou Bourbeux-Grand Coteau
Youngs South Coulee-Vermilion River	Sonnier Bayou-Bayou Blue
Beaver Creek	Bayou Tortue-La Salle Coulee
West Bayou Lacassine	Delahoussaye Canal
Bayou Wikoff	Tete Bayou
Bayou Arceneaux	Bayou Marron-Bayou Des Cannes
Turkey Creek-Caney Bayou	Bayou Mallet
Dry Slough-Bayou Nezpique	Bayou Veillon-coulee Coteau Holmes
West Fork Caney Creek	Bayou Grand Louis-Bayou Carron
Bayou Cypermort-Frontal Vermilion Bay	Keystone Ditch-Mermentau River
East Bayou Lacassine	East Fork Bayou Nezpique
Bayou Doza-Bayou Mallet	Grand coulee Ditch-Long Point Gully
Anselm coulee-Vermilion River	Richards Gully-Bayou Des Cannes
Bayou Teche	Chinquapin Creek-Calcasieu River
Black Lake-Bayou Cocodrie	Lyons Point Gully
Bayou Carlin-Frontal Intercoastal Waterway	Middle Bayou Serpent
Coulee Mine	Bayou Plaquemine Brule-Esterwood
Curtis Creek-Calcasieu River	Boggy Bayou
Bayou Blue	Bayou Portage-Coulee Portage
Bayou Chene	Grand Coulee Ditch-Bayou Plaquemine Brule
Bayou Choupique-Frontal Intercoastal Waterway	Lazy Point Canal-Bayou Queue De Tortue
Bayou Joe Marcel-Bayou Des Cannes	Lower Bayou Serpent
Bayou Du Portage-Coulee Du Portage	Evangeline Canal-Vermilion River
Bayou Bourbeux	Little Mill Creek
Bayou Berard Canal-Catahoula Coulee	Rogers Gully-Bayou Nezpique
Bayou Carron-Bayou Little Teche	Grand Louis Bayou-Bayou Nezpique
Prime Gully-Bayou Queue De Torte	Bayou Blanc-Bayou Plaquemine Brule
Tiger Point Gully-Bayou Des Cannes	Bayou Pont Brule-Coulee Cocodrie
Bayou Teche-Bayou Gerimond	Cypress Creek
Coulee Kenny	Bayou Tortue-Spanish Lake

Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices

Stines Creek-Calcasieu River	Bayou Cocodrie
West Bayou Grand Marais-Middle Bayou Grand Marais	Weeks Bayou-Frontal Intercoastal Waterway
Gum Gully-West Bayou Grand Marais	Upper Bayou Serpent
Bayou Pare Perdu-Lake Peigneur	Bayou Portage

Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes

Larto Lake-Saline Bayou	Larto Bayou-Red River
Bayou Milligan-Red River	Bayou Natchitoches
Long Fork-Bayou L'Eau Noire	Bayou Joson-Petite Riviere
Tiger Bayou	Black Bayou
Lake Louis-Bayou Louis	Gastis Creek
Rawson Creek	Big Creek-Ouachita River
Callahan Branch-Ouachita River	Haha Bayou
Brushley Bayou-Ouachita River	Crackets Bayou
Hibbs Bayou	Long Branch
Muddy Bayou	Big Bayou
Brushy Creek	Ford Creek
Salem Creek	Birds Creek-Sandy Lake
Greens Creek	Hawthorne Creek-Bushley Creek
Elm Slough-Little River	Rhinehart Creek-Bushley Creek
Black River Lake-Black River	Lake St. John-Black Bayou Lake
Cross Bayou	Glade Bayou-Black River
Brushy Bayou	Lake Concordia-Bayou Cocodrie
Boggy Bayou	Cocodrie Lake
Vidalia Canal-Bayou Cocodrie	Bayou Courville
Bayou Des Glaises	Outflow Channel-Red River
Long Bayou-Alligator Bayou	Bayou Natchitoches-Red River
Whites Bayou-Bayou Cocodrie	Wyches Bayou-Bayou Cocodrie
Greens Bayou	Durham Prong
Excelsior Lake-Bayou Cocodrie	Dismal Swamp-Bayou Cocodrie
Big Cash Bayou-Tensas River	Pool Lake Bayou

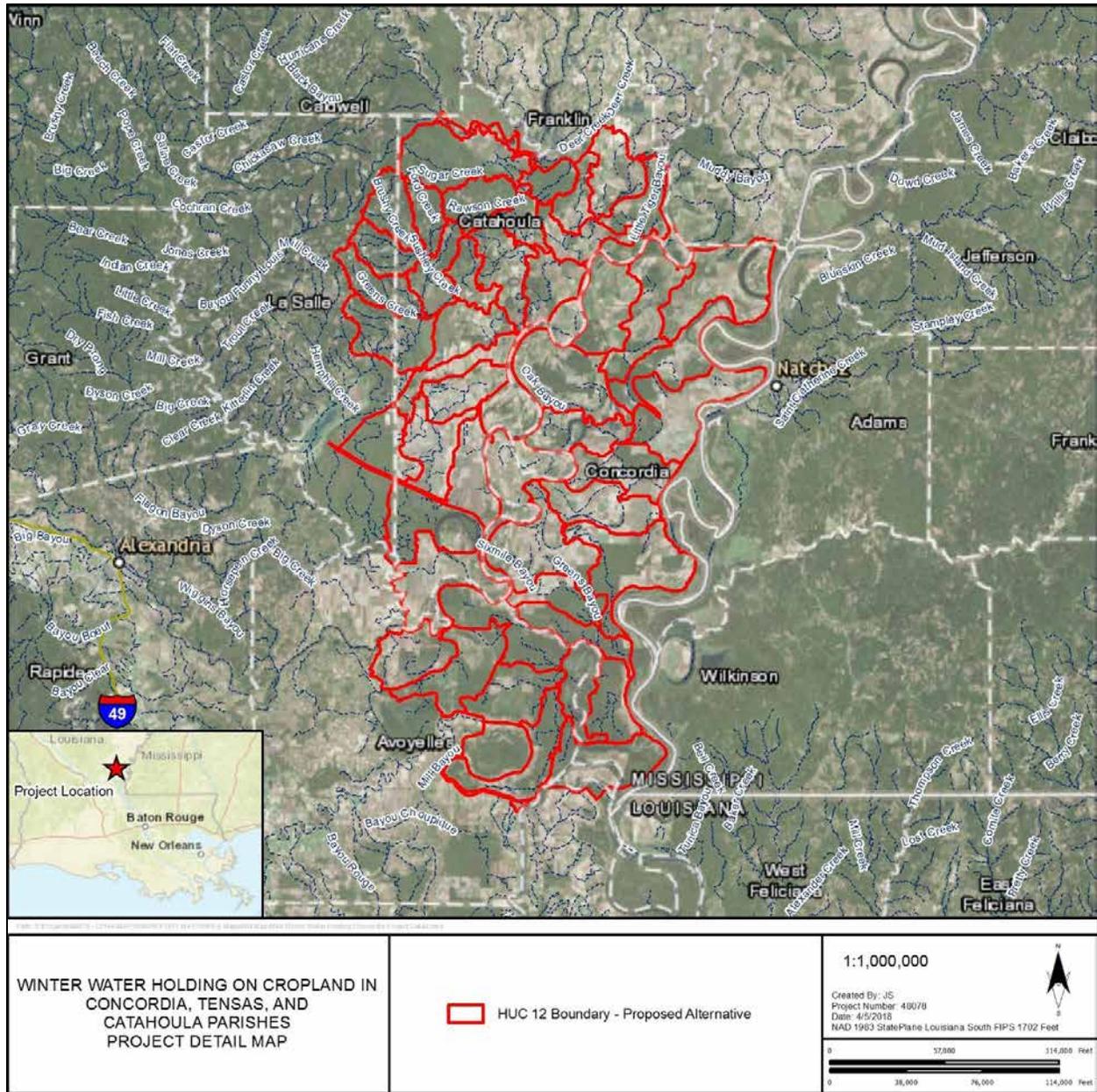


Figure 3.2-3a. Boundary for the Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes alternative, Theme 3.

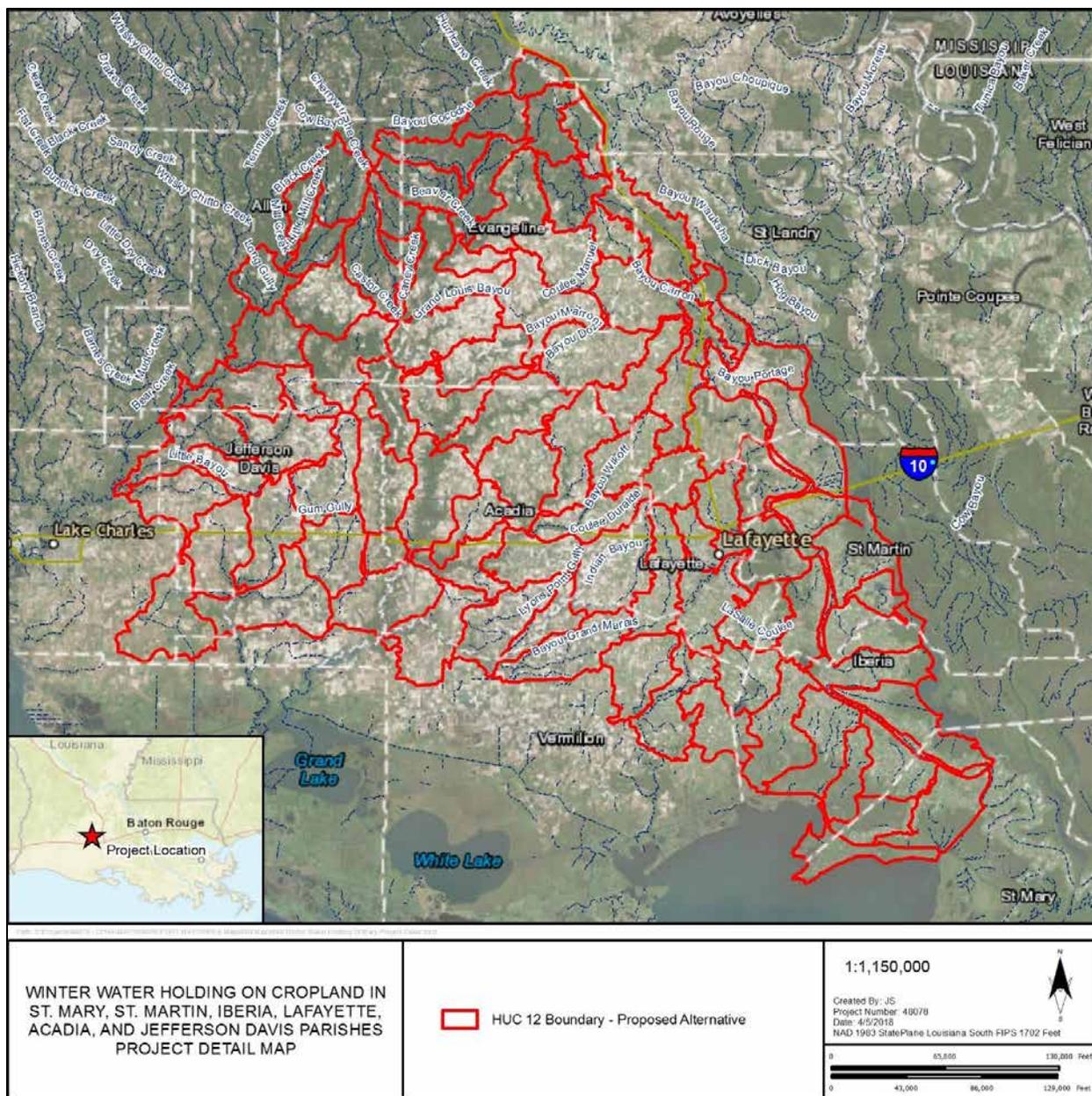


Figure 3.2-3b. Boundary for the Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Parishes alternative, Theme 3.

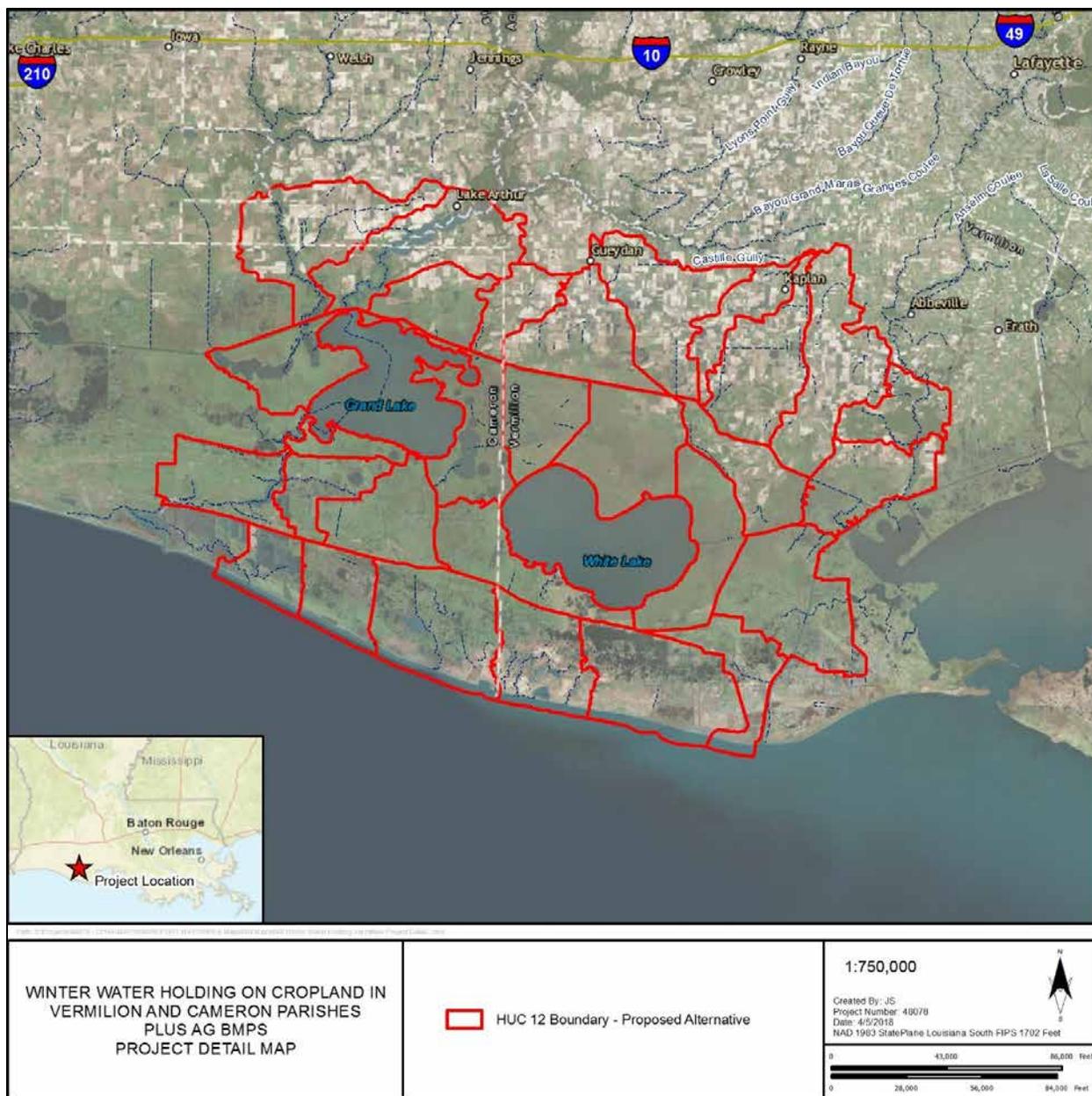


Figure 3.2-3c. Boundary for the Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices alternative, Theme 3.

The following land cover classes are located within the watershed of each alternative and Table 3.2-8 shows the breakdown by class and acres present within each alternative’s boundary. The alternatives would only target agricultural lands within these watersheds.

- Water: areas of open water, generally with less than 25% cover of vegetation or soil.
- Developed land: areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. These include parks, golf course, single-family housing units, large-lot single-family housing units, apartment complexes, row houses, and commercial and industrial lots.

- Barren: areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits, and other accumulations of earthen material.
- Forest: areas where trees are generally greater than 5 m tall and form greater than 20% of the total vegetation cover. Includes deciduous forest, evergreen forest, and mixed forest types.
- Shrubland: areas dominated by shrubs less than 5 m tall and with shrub canopy typically greater than 20% of the total vegetation. This class includes tree shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.
- Herbaceous: areas where graminoid or herbaceous vegetation are greater than 80% of the total vegetation. These areas are not subject to intensive management such as tilling, but can be used for grazing.
- Planted/cultivated: areas where active agricultural practices occur including growing pasture/hay and cultivated crop types. Pasture/hay is areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops typically on a perennial cycle. Cultivated crops are areas used for the production of annual crops and all areas being actively tilled.
- Wetlands: areas where soil or substrate is periodically saturated or covered with water. Includes woody wetlands and emergent herbaceous wetlands types.

Table 3.2-8. Land Use Category Acreage by Alternative

Land Use Category	Acres
Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices	
Water	91,050.42
Developed land	17,670.44
Barren	3,043.93
Forest	2,554.22
Shrubland	2,862.06
Herbaceous	2,685.88
Planted/cultivated	254,560.67
Wetlands	457,622.01
Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes	
Water	40,321.51
Developed land	40,255.28
Barren	857.38
Forest	115,174.17
Shrubland	22,263.93
Herbaceous	9,901.94
Planted/cultivated	493,831.32
Wetlands	357,005.11

Land Use Category	Acres
Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes	
Water	26,009.82
Developed land	271,730.80
Barren	3,609.21
Forest	180,833.81
Shrubland	131,452.73
Herbaceous	34,700.73
Planted/cultivated	1,535,739.69
Wetlands	510,673.08

Source: Homer et al. (2015).

Implementing USDA-developed CPs has been proven to successfully address natural resource concerns related to agricultural lands, and many of these practices can be used to achieve a number of the restoration types identified in the Final PDARP/PEIS. CPs are technical methods designed to help conserve soil, water, air, energy, and related plant and animal resources. Appendix D provides a list of CPs that would be available for implementation under the Theme 3 alternatives. Two CPs, 1) Pumping Plant and 2) Shallow Water Development and Management, are highlighted for the purposes of this RP/EA, to provide examples of the types of effects that may result from the application of different types of CPs. These effects represent some of the highest impact CPs; implementation of other CPs is anticipated to have lesser effects.

3.2.4.1.1 Pumping Plant

A pumping plant is a facility installed to transfer water for a conservation need, including removing excess surface or groundwater; filling ponds, ditches, or wetlands; or pumping from wells, ponds, streams, and other sources. The purpose of a pumping plant is to provide a dependable water source or disposal facility for water management on wetlands or to provide a water supply for irrigation, recreation, livestock, or wildlife. A pumping plant is useful for maintaining critical water levels in existing swamps, marshes, or open water and for providing water sources for newly constructed wetlands and ponds. Pumps may be mounted in the open, on pilings, or in a well or pit.

3.2.4.1.2 Shallow Water Development and Management

Shallow water development and management is the inundation of lands to provide habitat for fish and/or wildlife. The purpose is to provide habitat for wildlife such as shorebirds, waterfowl, wading birds, mammals, fish, reptiles, amphibians, and other species that require shallow water for at least part of their life cycle. Areas considered for shallow water developments require soils with low permeability or a seasonally high water table to inhibit subsurface drainage and allow for maintenance of proper water levels. Sites must be free of hazardous materials. The water supply for flooding during periods of planned inundation must be adequate and a methodology for dewatering is required when water levels must be artificially lowered in order to produce the desired habitat condition. Water levels must be maintained between 1 and 18 inches in depth over most of the area during periods of planned inundation, except for floodplain habitats connected to stream channels where water depths of up to 6 feet provide habitat for native fish species. Points of access must be developed for management activities and existing drainage systems would be used. Lastly, management techniques would be used to control invasive, federally and state listed noxious and nuisance plant species.

3.2.4.2 OIL POLLUTION ACT EVALUATION

This section provides the OPA evaluation for the winter water holding alternatives. If the alternatives under Theme 3 are selected, USDA would be the lead Implementing Trustee for the alternative working with other Trustees as partners. The implementation of CPs under these alternatives would be dependent on willing landowners and successful conservation planning to implement those actions.

3.2.4.2.1 Cost Effectiveness

The cost for the development and implementation of conservation plans and practices is reasonable for the alternatives (Table 3.2-9). The restoration approaches proposed by USDA to reduce nutrient loads from agricultural lands under Theme 3 have been applied extensively across the country, and the costs are well documented and reasonable (USDA 2014). USDA would implement the alternatives under Theme 3 by helping landowners voluntarily implement CPs that reduce nutrient runoff. The conservation planning, practice implementation, and monitoring costs represent best estimates from USDA and are consistent with previously implemented programs.

Table 3.2-9. Alternatives and Associated Cost

Alternative Name	Cost
Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices	\$3,500,000.00
Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes	\$1,500,000.00
Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes	\$1,500,000.00

This funding would not be used to fund previous activities required under local, state, or federal law (e.g., pollution reduction actions required by a CWA permit), but instead could be used in coordination with existing mandates to enhance water quality benefits. Through a coordinated and integrated watershed approach to project implementation, expected benefits include reductions in nutrient losses from the landscape; reductions in nutrient loads to streams and downstream receiving waters; reduction in water quality degradation (e.g., hypoxia and harmful algal blooms); and associated benefits to coastal waters, habitats, and resources. The LA TIG anticipates that the alternatives would result in improved water quality by reducing nutrient runoff into coastal waters.

3.2.4.2.2 Trustee Restoration Goals and Objectives

Theme 3 alternatives have a clear nexus to the injuries described in the Final PDARP/PEIS because implementation of CPs on agricultural lands would reduce nutrient enrichment and fecal coliform bacteria levels and help to restore water quality in Gulf of Mexico coastal watersheds. The health of the Gulf of Mexico depends upon the health of its estuaries, and the health of those coastal waters is influenced by land use upstream along tributary rivers. The primary goal for these alternatives under Theme 3 is water quality improvement through the Nutrient Reduction (Nonpoint Source) restoration type. Theme 3 alternatives would assist in restoring water quality impacted by the DWH Oil Spill by reducing the levels of nutrients and fecal coliform bacteria entering the Gulf of Mexico on a watershed scale. Runoff from agricultural lands contributes nutrients that adversely impact the health of coastal waters. The proposed CPs (see Appendix D) would reduce nutrient losses from the landscape, reduce nutrient loads to streams and downstream receiving waters, and reduce water quality degradation in watersheds that would provide benefits to estuarine and marine resources and coastal watersheds. These alternatives also align with the goals of the *Gulf Hypoxia Action Plan* (Mississippi River Gulf of Mexico Watershed Nutrient Task Force 2008) and Reassessment (Mississippi River Gulf of Mexico Watershed Nutrient Task Force 2013) by

reducing nutrient loading from cropland and grazing lands in key source watersheds. Further, Theme 3 alternatives are consistent with existing LA TIG goals and objectives that focus on opportunities for leveraged funding, Trustee expertise from state and federal programs and resource management expertise, and alternatives that are consistent with existing management plans and initiatives.

3.2.4.2.3 Likelihood of Success

USDA has demonstrated success in developing and implementing the same types of CPs in the watersheds where Theme 3 alternatives are located and in other similar watersheds. Given their extensive experience and expertise in CPs, the success and legacy of USDA conservation programs, and their established level of trust and cooperation with private landowners, there is a significant opportunity to implement CPs on private lands that would reduce the levels of nutrients entering watersheds, which could provide benefits to marine resources and coastal watersheds.

Examples of past successful water quality restoration projects include regional watershed management plans, state CWA 319 programs, and USDA conservation programs (i.e., EQIP, CRP, WRP, and WHIP). Additionally, USDA conservation programs and EPA have funded the successful implementation of agriculture CPs throughout the nation, resulting in significant reductions in nutrient loadings to water bodies nationwide (SWCS and ED 2007). Recently, USDA's CEAP evaluated the ecological impact of the agricultural CPs implemented in the Texas Gulf Basin (NRCS 2015). These practices combine structural practices for controlling water erosion with structural or tillage and residue management practices to reduce nutrient runoff throughout the Texas Gulf Basin. The combined use of these CPs has reduced sediment, nitrogen, and phosphorus loads delivered from cropland to rivers and streams by 60%, 41%, and 55%, respectively. Additionally, under Section 319 of the CWA, EPA provides grants to states who work with partners and stakeholders to control nonpoint source pollution. The Section 319 program has documented numerous examples of the use of conservation systems, or a combination of CPs used to address a specific resource concern, to restore water quality.

3.2.4.2.4 Prevention of Future Injury and Avoid Collateral Injury

USDA has applied CPs according to standards that require use of associated and mitigating practices in a "systems approach" to ensure new injuries do not occur and those practice standards would be followed under each nutrient reduction alternative. In addition, the LA TIG would ensure compliance with all applicable federal laws, regulations, and executive orders prior to implementation of the selected alternative by using a site-specific environmental evaluation process carried out during the conservation planning effort. This process would include conducting any necessary agency consultations and obtaining any required permits. Among other things, the environmental evaluation would identify mitigation measures needed and determine whether there is the potential for significant adverse effects to be created. If such potential exists, that particular alternative would be abandoned or redesigned to minimize the impacts. The LA TIG does not anticipate implementing any actions with potential for significant adverse effects. The alternatives would meet all the OPA and NEPA requirements as discussed in Sections 3 and 4 of this RP/EA.

3.2.4.2.5 Benefits to Multiple Resources

Under the Theme 3 alternatives, various CPs would be conducted on private lands to address nutrient reduction. Through a coordinated and integrated watershed approach to alternative implementation, benefits to multiple resources are anticipated from reductions in nutrient losses from the landscape and the resulting reductions in nutrient and fecal coliform bacteria loads to streams and downstream receiving waters. This would provide benefits to recreational uses as well as estuarine and marine resources and coastal watersheds. Additionally, winter water holding provides significant habitat for waterfowl, wading birds, shorebirds, and other wildlife dependent on shallow water for all or part of their life cycle.

3.2.4.2.6 Public Health and Safety

Participation in the conservation programs is voluntary and would be completed on private land under the guidance of USDA. There would be beneficial impacts to water quality in the watershed, which reduces risks to public health and safety. In addition, appropriate safety measures would be followed during CP design and implementation.

3.2.4.2.7 Alternative Evaluation Summary

The restoration approach “reduce nutrient loads to coastal watersheds” meets the criteria for being appropriate under OPA. If implemented properly, this approach would enhance ecosystem services provided by restored habitats and resources and may return injured natural resources and services to baseline by 1) reducing nutrient loads to coastal watersheds, 2) improving water quality, 3) reducing the extent of eutrophication and occurrence of low dissolved oxygen and/or harmful algal blooms, 4) reducing turbidity, and 5) increasing light penetration. Additionally, this approach can work to compensate for interim services losses to estuarine-dependent water column resources, oysters, submerged aquatic vegetation, and recreational uses adversely affected by the DWH Oil Spill. The restoration approach may compensate for lost ecosystem services by reducing nutrient runoff, which would improve water quality and mitigate chronic ecosystem threats (e.g., hypoxia, harmful algal blooms, and impaired recreational use) to provide ecosystem benefits to injured resources and habitats. The experience of USDA with the CPs under Theme 3 ensures they will be implemented successfully, will be cost effective, and will have a high likelihood of success. Additionally, nutrient reduction benefits multiple resources (water quality, flora and fauna, recreational uses dependent on higher functioning waters, etc.). In the unlikely event the CP is determined to have potential for collateral injury at a given location, it would be abandoned.

3.3 Oil Pollution Act Evaluation of Recreational Use Alternatives

This section provides information and analysis related to each of the recreational use alternatives, and is organized into three sections: 1) alternative descriptions, 2) OPA evaluation of the recreation alternatives, and 3) conclusions of the OPA evaluations. Each alternative-specific section begins with the alternative description, which includes location, alternative facilities and elements, costs, and schedules, followed by a discussion of the alternative’s consistency with project evaluation criteria and a description of planned monitoring.

3.3.1 Pass-a-Loutre Wildlife Management Area Crevasse Access

3.3.1.1 ALTERNATIVE DESCRIPTION

The Pass-a-Loutre Wildlife Management Area (WMA) Crevasse Access alternative was submitted by LDWF to enhance boating activity on the WMA. The WMA is approximately 10 miles south of Venice, Louisiana, in southern Plaquemines Parish near the mouth of the Mississippi River. The alternative would be implemented on lands owned and managed by LDWF and would include the construction of five crevasses (openings) in the natural spoil banks of the WMA’s passes (Figure 3.3-1). These crevasses would provide recreational hunters, fishermen, and non-consumptive users access to wetlands that are currently inaccessible by boat. These crevasses would also divert sediment-laden river water into shallow open ponds, enhancing habitat for wildlife and fisheries. The alternative would further enhance recreational use for the users of the WMA.

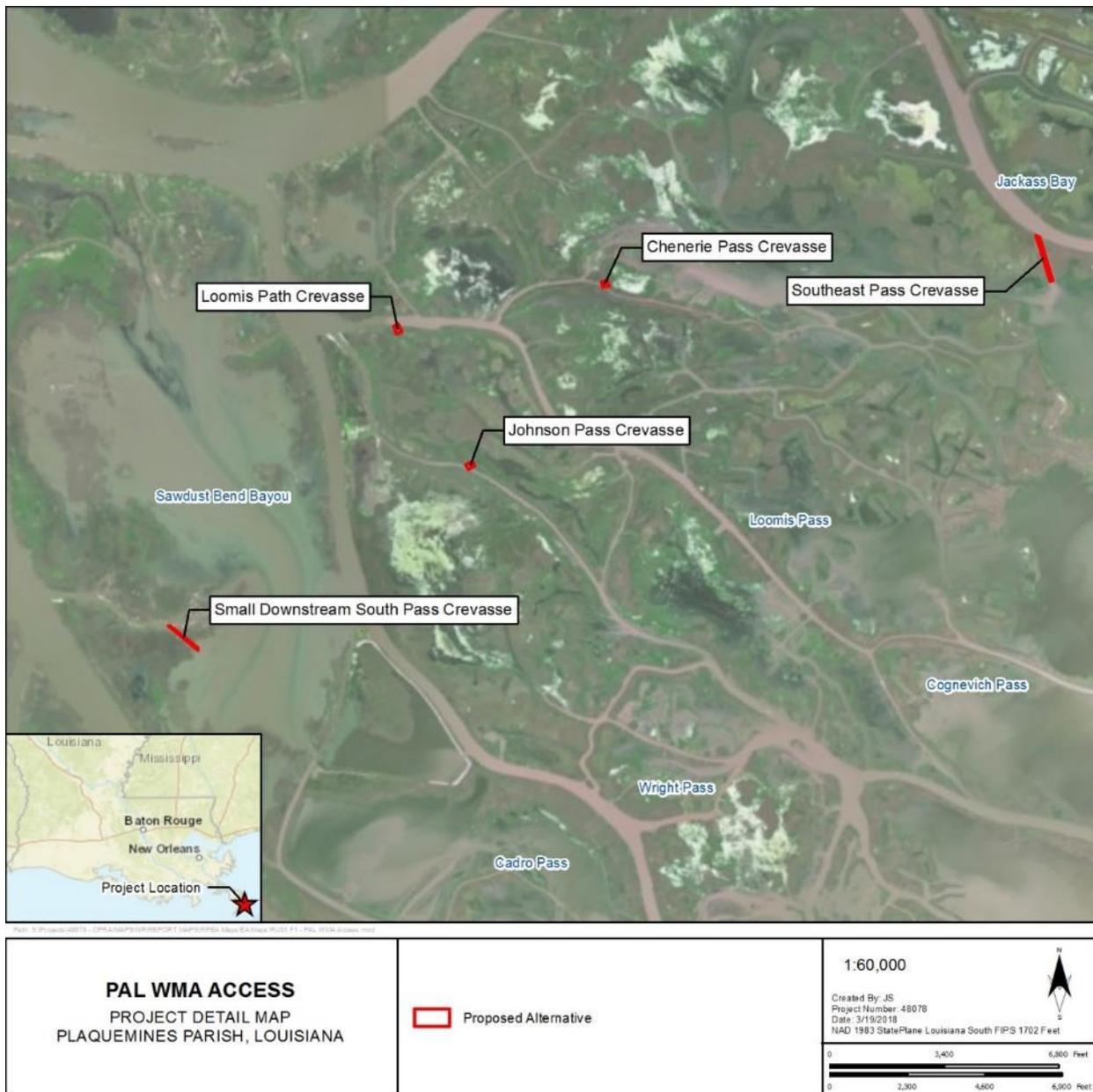


Figure 3.3-1. Location of the Pass-a-Loutre Wildlife Management Area Crevasse Access alternative.

3.3.1.1.1 Current and Historical Recreational Use

The Pass-a-Loutre WMA consists of a multitude of passes, canals, cuts, and crevasses, and is located on an 115,000-acre area managed by LDWF. Pass-a-Loutre WMA was the first WMA in the state and was established by an act of the state legislature on November 1, 1921, on the opening day of waterfowl season (LDWF 2014). Public access to this WMA is strictly by boat from one of the public boat launches throughout the parish; the nearest boat launch is located 10 miles north of the WMA in Venice. There are no roads onto or through this WMA.

The WMA is widely regarded as a world-class public waterfowl and fishing destination and hosts approximately 20,000 visitors annually. Although most of the recreational users are anglers in pursuit of both freshwater and brackish-water fish, waterfowl hunting is also very popular in the WMA.

3.3.1.1.2 Enhanced Recreational Use

The five crevasses that would be cleared by dredging are shown in Figure 3.3-1. The crevasses would have various depths and widths depending upon site conditions. Preliminary plans of these crevasses are shown in Appendix E, Figure E-1. The crevasses are described below:

- **Southeast Pass Crevasse:** This is a small, existing crevasse that opens into a large open water bay. The existing crevasse would be dredged to approximately 10 feet deep and widened to an average width of 100 feet for a length of approximately 1,550 feet.
- **Small Downstream South Pass Crevasse:** This crevasse would be a new feature created in an area of low vegetation density just off of South Pass Crevasse. This new crevasse would be dredged to 8 feet deep and widened to 40 feet for a length of 1,100 feet.
- **Johnson Crevasse:** This would be a newly constructed feature extending eastward from the open water of Johnson Pass and into a marsh area. The new crevasse would be dredged to 8 feet deep and widened to 30 feet for a length of approximately 250 feet.
- **Cheniére Crevasse:** This would be a newly constructed feature extending eastward from the open water of Cheniére Pass and into a marsh area. The new crevasse would be dredged to 8 feet deep and widened to 30 feet for a length of approximately 200 feet.
- **Loomis Pass Crevasse:** This would be a newly constructed feature extending southward from open water near Loomis Pass and into a marsh area. The new crevasse would be dredged to 8 feet deep and widened to 30 feet for a length of approximately 250 feet.

3.3.1.1.3 Construction Methodology and Schedule

The construction schedule has not been determined and would be finalized during design. Alternative design is currently underway, but construction methods have yet to be finalized. Dredging would be conducted using standard dredging methods, which typically include a bucket-style dredge or hydraulic dredge depending upon site conditions and amount of material to be moved. Dredge locations are not near dry land, so dredges are anticipated to be barge-mounted units.

Sediment dredged for the alternative would be placed on adjacent wetlands just above the tidal elevation to provide nesting habitat for a number of wetland species, such as secretive marsh birds and mottled ducks. This non-tidal habitat is lacking in this environment and believed to be one reason why the numbers of these wetland birds are in decline. It is important to note that crevasses are created within the WMA on a somewhat routine basis and are always considered self-mitigating. This type of alternative is designed to create new wetlands over time. A typical crevasse is designed to create between 10 and 300 acres of new wetland marsh over a 5- to 30-year life span, depending on location. They do so by diverting sediment-laden river water off the river, or passes of the river, into shallow bodies of calm water. Once in these bays or ponds, the sediment from the water column drops out and builds new land. These crevasses provide access to the interior marsh, which is highly attractive to fishermen and hunters that are unable to access the property otherwise.

3.3.1.1.4 Maintenance Requirements

LDWF, as owners and managers of the Pass-a-Loutre WMA, would be responsible for maintenance activities and repair costs over the life of the crevasses, and subsequent dredge spoils. The dredged crevasses are expected to have an operational long-term estimated lifespan of at least 10 years, with minimal maintenance required.

3.3.1.1.5 Monitoring Requirements

Monitoring would occur throughout construction to verify that the alternative is constructed as designed and would enhance recreational use. Post-construction performance monitoring would not be included in the cost estimate for the alternative and would be the long-term responsibility of LDWF. See Appendix C for the MAM plan for the alternative.

3.3.1.2 OIL POLLUTION ACT EVALUATION

3.3.1.2.1 Cost Effectiveness

The cost to implement the Pass-a-Loutre WMA Crevasse Access alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The total estimated construction costs for all five crevasses is \$1,568,000 (NRDA funds). The alternative has gone through a preliminary design process, and further E&D are needed for implementation of the alternative. The land required for the alternative is owned and managed by LDWF. No new rights-of-way or in-fee land acquisitions would be required. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects. The cost estimate of \$1,568,000 would be for construction of the alternative and would not include future funds for E&D, operation, maintenance, or monitoring of the alternative.

All work on the alternative would be awarded in compliance with Louisiana's public bid laws and regulations, ensuring that the alternative is constructed at current market rates.

3.3.1.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. Louisiana Trustees have identified lost recreational fishing opportunities as the most significant impact to recreational use in the state. In addition, the recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of multiple shoreline uses and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, fishing, and hunting that take place from the shoreline or from shoreline structures such as piers and docks. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast.

The alternative is designed to enhance boating activity by increasing access to recreational hunting, fishing, and wildlife viewing areas in the Pass-a-Loutre WMA, as well as enhancing user experience in the WMA more generally. Therefore, the alternative has a strong nexus to the public's lost recreational hunting and fishing and access to other shoreline uses. The recreational opportunities that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of hunting, lost days on the water, and loss of wildlife viewing, and shoreline access). Visitors accessing the WMA by way of the new access features are the same user population that the DWH Oil Spill affected, and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location and amenities are within the geographical footprint of the DWH recreational injury. The alternative is designed to be used by fishermen, by hunters, by other shoreline-based recreational users, and for bird and wildlife viewing. The crevasses would aid and enhance the public's ability to access and interact with natural resources in the Pass-a-Loutre WMA.

- **Scope of benefits:** The alternative would directly benefit a broader range and increased number of users in the WMA by enhancing public recreation access at the five interior marsh locations. Increased use of the WMA would be measured as part of the alternative's monitoring plan conducted by LDWF.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. However, benefits would likely accrue primarily to individuals who live near the Pass-a-Loutre WMA. Because of a lack of public transportation in the area, benefits would likely accrue primarily to individuals with adequate disposable income to own or maintain pirogues. The alternative would be open to the public, and no users would be actively excluded. During peak seasons (primarily fall and winter) capacity and crowding could limit the total benefits available.
- **Location:** There is no existing infrastructure at the five crevasse locations. The alternative's infrastructure would be new and provide enhanced access where access was previously nonexistent or limited.

3.3.1.2.3 Likelihood of Success

The alternative's goal of enhancing public access to the interior marsh of the WMA through constructing crevasses has a high likelihood of success because LDWF has successfully implemented similar recreational access projects in similar environments. LDWF constructs, monitors, and maintains similar facilities as part of its day-to-day natural resource management responsibilities. Construction methods for the alternative would follow standard methods used by LDWF to construct similar facilities in similar environments.

3.3.1.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The crevasses would be constructed in open water and vegetated marsh areas. In-water vegetation clearing or disturbance is expected; however, all in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis presented in Section 4.6.1.

3.3.1.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational fishing and hunting access, but the alternative also provide enhanced shoreline access and wildlife viewing.

The dredged sediment would be placed on bank lines adjacent to the crevasses to an elevation to support nesting waterfowl and secretive marsh birds. This placed sediment would also strengthen the bank line and reduce erosion into the crevasses, thus maintaining the function of the crevasses. Additionally, the crevasses themselves would divert sediment-laden water into nearby shallow ponds and bays and enrich wetlands for at least 10 years.

3.3.1.2.6 Public Health and Safety

Public health and safety are expected to be beneficially impacted by improving public access to difficult-to-reach areas, which may otherwise cause injury to users attempting access. Adverse impacts to public health and safety are not expected to result from the alternative. To minimize public safety hazards, LDWF would monitor and maintain each crevasse as needed.

3.3.1.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are reasonable, comparable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new and enhanced public access to trust resources that were injured by the DWH Oil Spill, and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.2 Pass-a-Loutre Wildlife Management Area Campgrounds

3.3.2.1 ALTERNATIVE DESCRIPTION

The Pass-a-Loutre WMA Campgrounds alternative was submitted by LDWF to improve five campgrounds on the WMA. The Pass-a-Loutre WMA is located approximately 10 miles south of Venice, Louisiana, in southern Plaquemines Parish near the mouth of the Mississippi River. The alternative would be implemented on lands owned and managed by LDWF and would include improvements at five existing campgrounds throughout the WMA (Figure 3.3-2). Campground improvements would include new picnic tables, fire pit/barbeque areas, and docks at all campgrounds. The alternative would also install bulkheads at two campgrounds and dredged shallow areas at three other campgrounds. The dredged material would be placed on the adjacent campgrounds to elevate the facility above expected storm-surge inundation elevations. This would protect much of the campground infrastructure during summer tropical storm events. The campground improvements would enhance the experience of campground users visiting the WMA, reduce ongoing erosion, and improve public access.

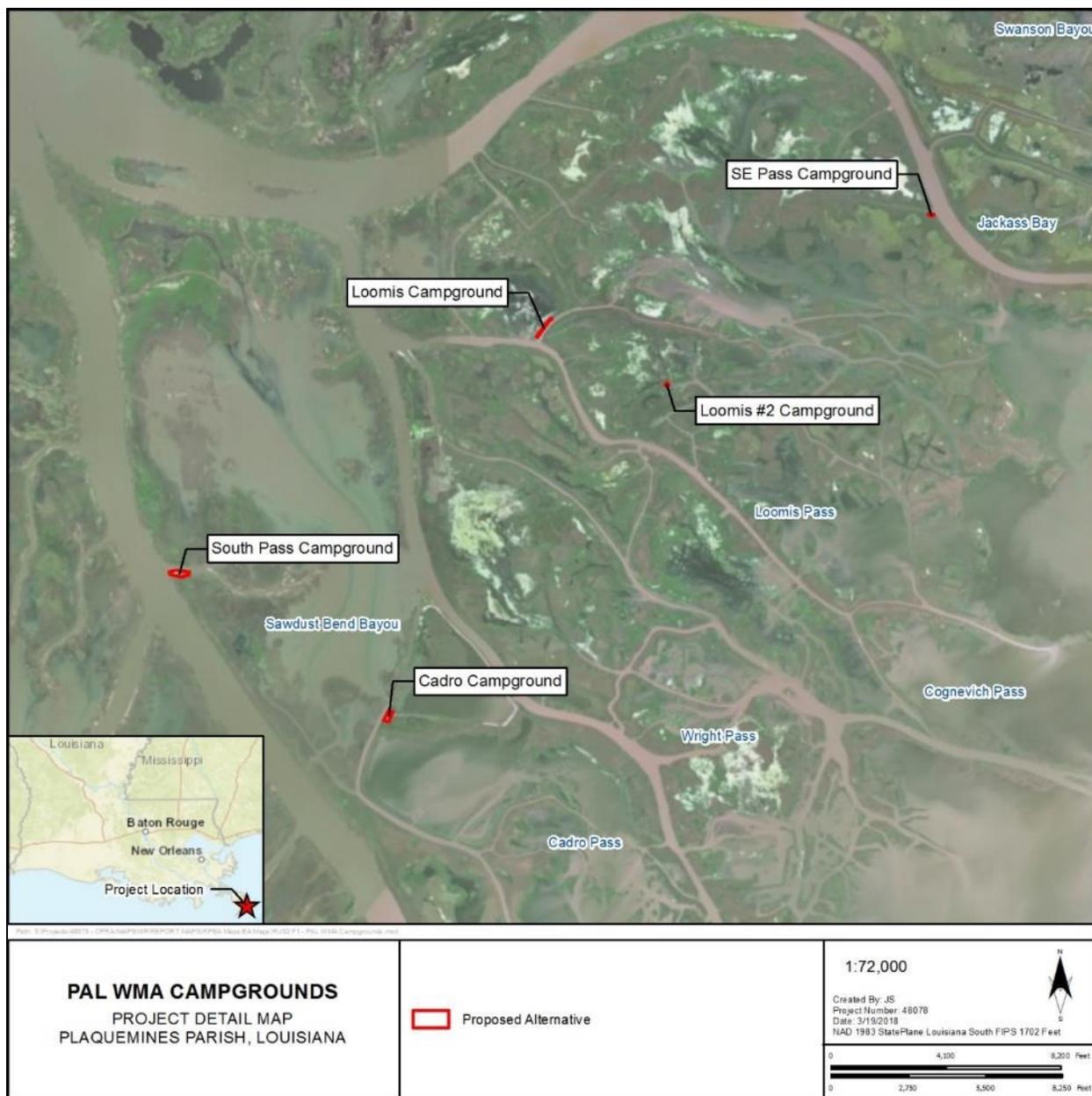


Figure 3.3-2. Location of the Pass-a-Loutre Wildlife Management Area Campgrounds alternative.

3.3.2.1.1 Current and Historical Recreational Use

The Pass-a-Loutre WMA comprises a multitude of passes, canals, cuts, and crevasses, and is located on a 115,000-acre area managed by LDWF. Pass-a-Loutre WMA was the first WMA in the state and was established by an act of the state legislature on November 1, 1921, on the opening day of waterfowl season (LDWF 2014). Public access to this WMA is strictly by boat, which can be accomplished from one of the public boat launches throughout the parish, the nearest of which is located 10 miles north of the WMA in Venice. There are no roads onto or through this WMA.

The WMA is widely regarded as a world-class public recreational destination, which hosts approximately 20,000 visitors annually. Most recreational users are anglers in pursuit of both freshwater and brackish water fish, such as bass, catfish, redfish, and speckled trout. The WMA is also frequented by waterfowl

and deer hunters. Many recreational users stay at one of the five public “tent only” campgrounds on the WMA. These campgrounds are currently unimproved and provide only mowed lawns and small docks for recreational users to pitch tents.

3.3.2.1.2 Enhanced Recreational Use

The alternative would enhance recreational use at the five campgrounds by providing new picnic tables, barbeque pits, and boat docks at all five campgrounds. The alternative would also install bulkheads at two campgrounds to reduce ongoing erosion, and dredge shallow areas at three campgrounds to improve boater access. Campgrounds where improvements are planned are shown in Figure 3.3-2 and are South Pass, Cadro, Loomis #1, Loomis #2, and Southeast Pass. Preliminary plans are shown in Appendix E, Figure E-2. Alternative elements by campground include the following:

- South Pass Campground
 - Install 266 linear feet of bulkhead and associated backfill. Backfill material would come from the adjacent waterway.
 - Install 100 linear feet of boat dock. Dock dimensions and construction type would be determined during design.
 - Install five mobile picnic tables made of steel dipped in a rubber coating.
 - Install five fire pit/barbeques.
 - Dredge approximately 6,500 cubic yards of sediment to enhance access to the campground.
- Cadro Campground
 - Install 100 linear feet of boat dock. Dock dimensions and construction type would be determined during design.
 - Install eight mobile picnic tables made of steel dipped in a rubber coating.
 - Install eight fire pit/barbeques.
- Loomis #1 Campground
 - Install 210 linear feet of boat dock. Dock dimensions and construction type would be determined during design.
 - Install eight mobile picnic tables made of steel dipped in a rubber coating.
 - Install eight fire pit/barbeques.
- Loomis #2 Campground
 - Install 65 linear feet of boat dock. Dock dimensions and construction type would be determined by during design.
 - Install three mobile picnic tables made of steel dipped in a rubber coating.
 - Install three fire pit/barbeques.
 - Dredge approximately 400 cubic yards of sediment to be placed on the campground.
- Southeast Pass Campground
 - Install 150 linear feet of bulkhead and associated backfill. Backfill material would come from the adjacent waterway.
 - Install 105 linear feet of boat dock. Dock dimensions and construction type would be determined during design.
 - Install five mobile picnic tables made of steel dipped in a rubber coating.

- Install five fire pit/barbeques.
- Dredge approximately 750 cubic yards of sediment to improve boater access near the campground and new boat dock.

3.3.2.1.3 Construction Methodology and Schedule

Construction of the alternative would take place between February 1 and November 1.

Alternatives of this scope typically require approximately 6 months to complete. Alternative design is currently underway, but construction methods have yet to be finalized. However, it is expected that dock construction and associated pile driving would be completed from the water on a floating vessel, and would include a connected walkway from the dock to the shoreline. Approximately 580 linear feet of dock would be constructed.

Dredging is expected to be conducted to a depth appropriate for recreational boat passage (approximately 8 to 10 feet) using standard bucket-style or hydraulic dredge equipment. Dredge spoils would be placed on the campgrounds to elevate the facility above expected storm surge inundation elevations. If there is need for backfill behind newly installed bulkheads, and site conditions are suitable, spoil material may be used in these areas.

Typical bulkhead installations include interlocking sheet pile (steel, aluminum, vinyl, or composite material based on site conditions) that are driven directly into the sediment. If wooden pilings are used as bulkheads, they would typically be driven into the sediment, and include sheeting material (e.g., treated lumber) placed behind the pilings. Because the piles or sheet piling would be installed in water, typical installation would likely occur from a boat- or barge-mounted vibratory or impact hammer system.

It is anticipated that pre-constructed picnic tables, made of steel dipped in a rubber coating, would be used and placed at campsites within each campground. Construction of fire pit/barbeque areas would consist of a heavy gauge steel fire ring with a barbeque grate on top.

3.3.2.1.4 Maintenance Requirements

LDWF would be responsible for maintenance activities and repair costs over the life of the facilities.

3.3.2.1.5 Monitoring Requirements

Monitoring would occur throughout construction to verify that the alternative is constructed as designed and would enhance recreational use. Post-construction performance monitoring would not be included in this cost estimate for the alternative, and would be the responsibility of LDWF up to 1 year. Monitoring schedules are anticipated to be adaptive based on long-term alternative performance, e.g., seasonal monitoring may be needed if use is low and repairs are rare, or more frequent monitoring may be needed if use is high and repair needs are common. See Appendix C for the MAM plan for the alternative.

3.3.2.2 OIL POLLUTION ACT EVALUATION

3.3.2.2.1 Cost Effectiveness

The cost to implement the Pass-a-Loutre WMA Campgrounds alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The total estimated construction costs for improvements at all five campgrounds is \$1,624,000 (NRDA Funds)

The alternative has gone through a preliminary design process, and further E&D are needed for implementation of the alternative. The land required for the alternative is owned and managed by LDWF. No new rights-of-way or in-fee land acquisitions would be required. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects. The cost estimate of \$1,624,000 would be for construction of the alternative only, and does not include future funds for operation, maintenance, or monitoring of the alternative.

All work on the alternative would be awarded in compliance with Louisiana's public bid laws and regulations, ensuring that the alternative is constructed at current market rates. Projections of operating costs and use were based on other similar projects managed by LDWF.

3.3.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. Louisiana Trustees have identified lost recreational fishing opportunities as the most significant impact to recreational use in the state. In addition, the Final PDARP/PEIS focuses on loss of multiple shoreline uses and boating (DWH Trustees 2016). Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, fishing, and hunting that take place from the shoreline or from shoreline structures such as piers and docks. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational camping, boating, and hunting experiences by improving multiple campgrounds and installing new boat docks at each campground in the Pass-a-Loutre WMA. The alternative would also likely enhance recreational fishing by adding boat dock facilities and shoreline access. Therefore, the alternative has a strong nexus to the public's lost recreational fishing and access to shoreline uses.

The recreational opportunities that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of hunting, lost days on the water, and loss of wildlife viewing, and shoreline access). Visitors accessing the improved campgrounds and new boat docks are the same user population that the DWH Oil Spill affected, and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location and amenities are within the geographical footprint of the DWH recreational injury. The alternative's campground improvements and new boat docks are designed to be used by boat- and shoreline-based recreational anglers, as well as shoreline-based campers and hunters, which would aid and enhance public user ability to access and interact with natural resources in the Pass-a-Loutre WMA.
- **Scope of benefits:** The alternative would directly benefit a broader range and number of users in the WMA by enhancing the quality of public campgrounds and providing new boat docks, which would improve user access to shoreline activities. Increased use of these enhanced-access locations would be measured as part of the alternative's monitoring plan conducted by LDWF.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. However, benefits would likely accrue primarily to individuals with adequate disposable income to own or maintain a boat. The alternative would be open to the public, and no users would be actively excluded. During peak seasons (primarily fall and winter), capacity and crowding could limit the total benefits available.

- **Location:** The alternative's infrastructure would enhance the existing campgrounds and provide additional benefits to users at all five campground locations. The campgrounds are currently accessible to users by boat, but docking facilities are poor and existing campgrounds require improvements to be more desirable and serviceable. Because the campground locations already exist, the proposed campground improvements would imply a high marginal value for the alternative. The alternative is approximately 10 miles south of Venice, and is open to the public.

3.3.2.2.3 Likelihood of Success

The alternative's goal of improving the existing campground facilities throughout the WMA has a high likelihood of success because no land acquisition or new rights-of-way are required, and LDWF has successfully implemented similar campground improvement projects throughout Louisiana in similar environments that have been well received and used by the public. LDWF constructs, operates, monitors, and maintains similar facilities as part of its day-to-day natural resource management responsibilities. Construction methods for the alternative would follow standard methods used by LDWF to construct similar facilities in similar environments.

3.3.2.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The new dock facilities would be constructed in open water or vegetated shoreline areas; however, all in-water work, and work in vegetated shoreline areas would be conducted in compliance with federal, state, and local laws and regulations. Upland disturbances to soils and vegetation at each campground would be limited to the relatively small areas where fire pit/barbeques would be installed. New bulkheads proposed at two of the campgrounds would address current, and prevent future, soil erosion; reduce localized water turbidity; and act to preserve existing upland vegetation. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis presented in Section 4.6.2.

3.3.2.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational camping and boating, but the alternative would also provide enhanced shoreline access, hunting, fishing, and wildlife viewing. Placement of dredged sediments on the campground would elevate the facility above expected storm surge inundation elevations. This would protect much of the campground infrastructure during summer tropical storm events. Bulkheads installed to protect campgrounds would also benefit surrounding upland areas.

3.3.2.2.6 Public Health and Safety

Public health and safety are expected to be beneficially impacted by improving public campground facilities with designated fire pits/barbeque areas and picnic tables. The new boat docks would improve public boat mooring conditions and provide safer access to the shoreline. Dredging at three of the boat dock areas would further improve boater navigation and safety. New bulkheads at two of the campgrounds would improve shoreline stability for public users. Adverse impacts to public health and safety are not expected to result from the alternative. To minimize public safety hazards, LDWF would monitor and maintain each campground as needed.

3.3.2.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are reasonable, comparable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new/improved camping, boating, and shoreline access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.3 Grand Isle State Park Improvements

3.3.3.1 ALTERNATIVE DESCRIPTION

The Grand Isle State Park Improvements alternative was submitted by the Louisiana Office of State Parks. The alternative would involve three elements: 1) upgrading an existing pier to improve fishing access; 2) upgrading three existing rock jetties and constructing two groins at three locations (the east end of Grand Isle at Grand Isle State Park, the west end of Grand Isle at the Grand Isle West property, and the Fort Livingston property) to provide habitat for shallow-water, nearshore marine species of recreational value; and 3) repairing and upgrading existing roads and nature trails damaged by repeated flooding. The alternative would provide improved fishing and recreational use of the state park and also provide protection of coastal, nearshore marine habitats and inland infrastructure.

The alternative is located in Jefferson Parish on Grand Isle (Figure 3.3-3). Most of the alternative is located southeast of the corner of Louisiana Highway 1 and Admiral Craik Drive, extending east for approximately 0.95 mile and south from Admiral Craik Drive to the Gulf of Mexico. In addition, there are rock jetties and groins that are part of the alternative proposed in three locations: 1) directly north and east of the Grand Isle State Park on the northern tip of Grand Isle, extending over an approximately 0.75-mile-wide area; 2) south and west of the southwestern coastline of the Fort Livingston property approximately 0.80 mile northeast from where Admiral Craik Drive dead-ends, across the entrance to Barataria Bay, and on the southwestern tip of Isle Grande Terre; and 3) along the southern coastline of the state park property known as Grand Isle West, which is located at the southwestern tip of Grand Isle approximately 0.40 mile south of the southeastern end of the Caminada Pass Bridge (Louisiana Highway 1). The primary address is 108 Admiral Craik Drive, Grand Isle, Louisiana 70358. No physical address exists for the other two properties associated with the existing rock jetties.



Figure 3.3-3. Location of elements within the Grand Isle State Park Improvements alternative.

3.3.3.1.1 Current and Historical Recreational Use

The State of Louisiana purchased the 150-acre site that became the Grand Isle State Park in 1968. Since then, infrastructure has been added to the state park, which currently includes roads, nature trails, four parking lots, a recreational vehicle (RV) campsite, one fishing pier, one crabbing pier, two bathhouses with boardwalks, and multiple rock jetties. The Grand Isle State Park provides access to recreational activities including fishing, crabbing, beach access, bird watching, and nature trails. The current conditions and use of the areas that encompass each of the three proposed elements are discussed below.

The existing T-shaped fishing pier, which extends approximately 300 feet southeast into the Gulf of Mexico from the edge of high tide, has experienced sediment build up around the pier that effectively degrades fishing access by reducing water depth. This limits the fish species diversity by reducing fish access and reducing available shallow-water habitat to the areas around the pier. These conditions have had a negative effect on recreational use of the fishing pier.

The existing rock jetty at the north end of Grand Isle State Park is currently functioning well, but an extension of this rock jetty would allow for greater protection and expansion of the shallow-water and lagoon natural areas, which provide important habitat for fish, birds, and other wildlife. The existing rock jetty off of the southern coastline of the Grand Isle West property is insufficient and failing to prevent erosion of the beach at the southern tip of the Grand Isle. The existing rock jetty off of the southern coastline of the Fort Livingston property is also insufficient, making the historic pre-Civil War fort vulnerable to potential natural threats, including erosion and flooding. The beach is receding just east of the fort, and erosion is migrating behind the existing jetty toward the fort's foundation. The shore on the west side just north of the fort is also receding, and the erosion is migrating behind the existing jetty toward the fort. These threats are impacting safe shoreline access by recreational users through the loss of shoreline. If current erosion patterns continue, the entire west end of Grand Terre Island could be lost, thereby severely restricting shoreline access by recreational users.

The existing roads and nature trails throughout Grand Isle State Park need repairs and upgrades due to damage from repeated flooding of the park. The existing asphalt roads are currently in such poor condition that they would be considered unimproved roads. The existing nature trails, which are mostly composed of limestone and wooden boardwalks, require improvement and expansion. These trails have incurred damage from repeated floods and storms that have resulted in the loss of limestone surfacing on trails and accelerated deterioration of boardwalks.

3.3.3.1.2 Enhanced Recreational Use

The Louisiana Office of State Parks is pursuing the alternative to repair and upgrade existing recreational infrastructure in and around the Grand Isle State Park and to improve access to recreational opportunities and natural resources, including the protection of shoreline integrity and inshore infrastructure. Each of the three alternative elements would address one or more of these goals and are further described below.

Fishing Pier

This element would include upgrades to the existing fishing pier to improve fishing access and provide needed amenities, including lighting, ADA-compliant fishing rail sections, benches, shaded structure area(s), and a fish-cleaning station. This element includes the construction of a 400-foot-long × 16-foot-wide pier extension from the northeast corner of the T-portion of the existing pier, likely at a 30-degree angle, with a heading due east. The angle change of the pier would place the extension perpendicular to the beach line, reaching deeper water in the shortest distance possible. These improvements would increase recreational fishing opportunities for all visitors and improve the overall fishing experience.

Upgrading the existing fishing pier would include the following:

- Fifty-four piles measuring 40 feet each, driven into the sand bottom by at least 15 feet with pairs spaced 15 feet apart
- One 400-foot-long and 16-foot-wide pier with built-in benches, lighting, and fish-cleaning area constructed from large, marine-grade, pressure-treated, timber members and stainless-steel fasteners

Rock Jetties

This element would include upgrades to the existing rock jetties at the Grand Isle State Park, the Grand Isle West property, and the Fort Livingston property. These upgrades would involve the extension of existing rock jetties and groins that would provide protection for several different aspects of the natural and built environment, including protection and expansion of the shallow-water and lagoon habitats to the north of the Grand Isle State Park, protection from continued beach erosion along the southern coastline of the Louisiana Office of State Parks–owned Grand Isle West property, and protection of the historic pre–Civil War fort on the Louisiana Office of State Parks–owned Fort Livingston property from continued flooding and erosional forces. The rock jetty upgrades to the north end of the Grand Isle State Park would not only provide ecological benefits to this natural area, which historically serves as a fish nursery, site for nesting birds, and flock resting areas. They would also provide visitors with additional fishing opportunities and a place to learn about natural processes and habitats of the local region.

Upgrading the existing rock jetties would include the following:

- One 200-foot-long × 35-foot-wide × 48-inch-deep jetty extension at the northeast corner of the Grand Isle State Park. Approximately 1,556 tons of rock would be needed for the jetty extension, constructed with large to boulder size rocks, averaging at least 200 hundred pounds each and matching existing jetty material. The purpose of this jetty extension is to trap sediment along the shoreline.
- One 1,700-foot-long × 22.5-foot-wide × 24-inch-deep jetty extension to the north starting at the north end of the existing jetty on the north end of Grand Isle State Park (Grand Isle East), turning to run west to cover a small land break, and ending at the tip of a small island at the mouth of the lagoon habitat. Approximately 4,250 tons of rock would be needed for the jetty extension, constructed with large to boulder size rocks, averaging at least 200 hundred pounds each and matching existing jetty material. The purpose of this jetty extension is to protect the shoreline from erosion and prevent land loss.
- Three 200-foot-long rock groins with gaps between each of them, totaling between 900 and 1,000 feet long with variable groin and gap lengths, southeast of the Fort Livingston property, constructed with large to boulder size rocks, averaging at least 200 hundred pounds each and matching existing jetty material. The purpose of the groins is to trap sediment, prevent continued shoreline erosion, and prevent the eventual undermining of the fort.
- One 900-foot-long jetty extension to the north starting at the north end of the existing jetty west of the Fort Livingston property and ending at the northern tip of the island and constructed with large to boulder size rocks, averaging at least 200 hundred pounds each and matching existing jetty material. The purpose of this jetty extension is to protect the shoreline, prevent land loss, and prevent the eventual undermining of the fort.
- Three 200-foot-long rock groins with gaps between each of them, totaling between 900 and 1,000 feet long with variable groin and gap lengths, southeast of the Grand Isle West property, constructed with large to boulder size rocks, averaging at least 200 hundred pounds each and matching existing jetty material. The purpose of the groins is to trap sediment and prevent continued shoreline erosion.

Roads and Trails

This element of the alternative would include repairs to roads and trails within the Grand Isle State Park for damages associated with heavy equipment used to remove sand from the roadways after flood events. The roads and parking lots provide access to the park, campsites, bathhouses, fishing and crabbing piers, and trails. The trails provide access to onshore fishing and offer educational opportunities regarding plant and wildlife habitats. Repairing the park's road and trail infrastructure is vital for preserving public access to and recreational opportunities from the park's natural resources.

Repairing and upgrading existing roads and trails would include the following:

- Two roads totaling 3.05 miles and approximately 296,630 square feet of roadway would be repaired in the following areas:
 - Approximately 1.3 miles and 167,270 square feet of existing roads, including the divided entry road from the public street and the two main park roads leading to the campground and fishing piers, with 12-foot-wide lanes and a stone-dressed shoulder of no more than 2 feet wide. Repair would primarily include pothole repairs to the road base and a 2-inch asphalt overlay.
 - Approximately 1.75 miles and 129,360 square feet of existing roads, which includes three one-way travel lanes and multiple camp spurs, with 12-foot-wide lanes and a stone-dressed shoulder of no more than 2 feet wide. Repair would primarily include pothole repairs to the road base and a 2-inch asphalt overlay.
- Four paved parking lots, totaling 77,500 square feet, with repairs consisting primarily of pothole repairs to the road base and a 2-inch asphalt overlay at the following areas: a campground bathhouse, day-use bathhouse, fishing pier, and crabbing pier.
- Approximately 1.8 miles (9,755 linear feet) of nature trails (one continuous loop), averaging approximately 4 feet wide, consisting primarily of crushed stone. Repair would be consistent with original construction methods and include laying new crushed stone paths and repairing wooden boardwalks.

3.3.3.1.3 Construction Methodology and Schedule

A conceptual design has already been developed. The alternative's specific construction schedule would be determined during E&D, but it is estimated that if work is done concurrently, all work could be complete in 27 to 29 months. If the work is done sequentially it would take approximately 65 months to complete the alternative. In-water work would take approximately 24 months. All work would be subject to approval of permits and environmental review. The construction schedule would include contracting, pre-construction, and construction activities. The construction methodology for each of the three alternative elements is described below.

Fishing Pier

Construction of the 400-foot-long fishing pier extension alternative element would require in-water work and involve several phases of construction. Approximately 54 piles would be needed to support the pier and would be driven into the sand bottom along the proposed pier placement, with a set of two piles installed approximately every 15 feet. Each of these piles would be driven past the 15-foot engineering-set minimum depth into the substrate. These piles would be at least 40 feet long to allow for substrate penetration, varying water depths, height of water, rail height, and lighting. Construction methods for the pier extension would be similar to those of the existing pier and include the use of large, marine-grade, pressure-treated timber piles and stainless-steel fasteners. Pressure-treated wood products are manufactured and installed in a manner that minimizes any potential for adverse impacts to aquatic environments. The piles would be driven using an impact hammer pile (vibratory hammers are not typically used on timber piles) with standard equipment (crane, boom, set of leads, pile hammer, helmet, pile gate, and pile monkey). The crane and associated equipment would likely be staged on a barge. Pier construction would likely include built-in benches, lighting, a fish-cleaning area, an ADA fishing rail, and shade structure section(s). The pier would be approximately 16 feet wide. Barged heavy equipment would likely be needed for this construction. It is anticipated that 10 months would be needed to complete the design phase of the alternative and 12 months would be needed for construction. The in-water work would likely take approximately 12 months to complete.

Rock Jetties

The extension of three rock jetties is included in the alternative and would require in-water work and placement of large rock material in navigable waters. There are two jetty extensions for the Grand Isle State Park: 1) one 200-foot-long jetty extension at the northeast corner of the Grand Isle State Park and 2) one 1,700-foot-long jetty extension to the north starting at the north end of the existing jetty, which turns to run west to cover a small land break and ends at the tip of a small island at the mouth of the lagoon habitat. There are two jetty extensions for the Fort Livingston property and three 200-foot-long rock groins with gaps between them that would have variable groin and gap lengths. The other jetty is located southeast of the Fort Livingston property where a 900-foot-long extension to the north is proposed. The extension would begin at the north end of the existing jetty west of the Fort Livingston property and end at the northern tip of the island. There is also a jetty extension for the Grand Isle West property proposed that includes three 200-foot-long rock groins with gaps between of them that would have variable groin and gap lengths, southeast of the Grand Isle West property.

Construction of the proposed jetty and groin extensions would be similar to that of the existing jetties and would include placing large to boulder size rocks, averaging at least 200 hundred pounds each and matching existing jetty material, in the proposed areas with a track hoe or barged heavy equipment. The proposed jetty extensions would have similar widths to the existing jetties, 20 to 35 feet wide. It is anticipated that 12 months would be needed to complete the design phase of the alternative and 15 months for construction. The in-water work would take approximately 11 months to complete.

Roads and Trails

The repair of roads and trails within the Grand Isle State Park would include all main park circulation roads, large parking areas, and the trail system. Road improvements would place a high-grade asphalt overlay, such as Superpave, that would provide at least a 2-inch lift in road elevation and pothole repairs. Road repairs are proposed for approximately 1.3 miles of the existing divided entry roads and two main park roads, approximately 1.75 miles of the three one-way travel lanes, as well as multiple camp spurs within the campsite. The roads would be 12 feet wide with a 2-foot shoulder. The total area of road repair would be approximately 296,630 square feet. Parking lot repairs would also be similar to the proposed road repairs with four paved parking lots, totaling 77,500 square feet.

The proposed trail repairs would be conducted over 1.8 miles (9,755 linear feet) of the large loop trail that circles the lagoons. This trail includes one large wooden boardwalk at the lagoon outfall and a couple of small wooden boardwalk sections. The rest of the trail consists of crushed stone and is approximately 4 feet wide. Trail repairs would place new crushed stone, and damage to the existing wooden boardwalks may necessitate some in-water work. The total area of trail repair would be approximately 39,020 square feet.

It is anticipated that 6 months would be needed complete the design phase of the alternative and 10 months for construction.

3.3.3.1.4 Maintenance Requirements

The Louisiana Office of State Parks would be responsible for all maintenance activities and costs related to the new or improved structures, including the fishing pier extension, the improved roads and trails, and the extended rock jetties. They would also be responsible repairs over the life of these structures. Fees associated with the park, including camping fees, would not be expected to change from the current system as a result of implementation of the alternative.

3.3.3.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that all alternative elements are constructed as designed, and that the alternative enhances recreational use compared with pre-alternative conditions. The Louisiana Office of State Parks would be responsible for performance and use monitoring and for obtaining as-built designs from the alternative engineer. Funding for post-construction monitoring is not included in the alternative cost estimate, and would be provided by the Louisiana Office of State Parks. See Appendix C for the MAM plan for the alternative.

3.3.3.2 OIL POLLUTION ACT EVALUATION

3.3.3.2.1 Cost Effectiveness

The cost to implement the Grand Isle State Park Improvements alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The cost of the alternative is \$6,126,967 (Table 3.3-1). The alternative has gone through a preliminary design process, and further E&D are needed prior to implementation. The alternative would be implemented in an existing state park with existing camping and use fees to fund the operation and maintenance of the park. The rock jetty improvements are not anticipated to require on-going operation or maintenance in the near-term. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects.

The estimated cost for the alternative is \$6,126,967, which includes E&D (including pre-construction testing and surveys), construction, and materials for each of the alternative elements (see Table 3.3-1). This cost estimate does not include funds for operation, maintenance, or monitoring the alternative.

Table 3.3-1. Construction Cost Estimate - Grand Isle State Park Improvements Alternative

Description	Cost
Fishing Pier Extension Subtotal	\$1,500,000
Construction and materials	\$1,200,000
E&D	\$300,000
Rock Jetty Extensions Subtotal	\$3,897,000
Construction and materials	\$3,120,000
E&D	\$777,000
Road, Parking, and Trail Repairs Subtotal	\$729,967
Construction and materials	\$583,974
E&D	\$145,993
Total (NRDA funds)	\$6,126,967

All alternative work would be awarded in compliance with Louisiana’s public bid laws and regulations, ensuring that the alternative is constructed at current market rates. Projections of operating costs and use were based on other similar alternatives managed by the Louisiana Office of State Parks.

3.3.3.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed earlier in this RP/EA, most of the recreational use loss in Louisiana as a result of the spill was to recreational fishing. The recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational fishing experiences both by increasing visitation and enhancing the quality of future recreational visits to the area. For this reason, the alternative's goal of improving access to fishing and protecting nearshore and inland structures would have the benefit of providing shoreline-based recreational activities and fishing. Therefore, the alternative has a strong nexus to the public's lost recreational fishing and access to shoreline uses. The recreational opportunities that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to the pier and park shoreline areas are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location and amenities are within the geographical footprint of the DWH recreational injury. The alternative's pier extension, jetty extensions, and improved road and trail elements are designed to be used by shoreline-based recreational anglers and aid and enhance their ability to access and interact with natural resources around the Grand Isle State Park.
- **Scope of benefits:** The scope of benefits for the alternative's pier extension, jetty extensions, and road and parking area improvements would be a direct function of capacity use at the park and would be measured as part of the alternative's monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. However, because of a lack of public transportation in the area, benefits would likely accrue primarily to individuals who live within a reasonable driving distance of Grand Isle State Park and own vehicles to get the park for onshore activities or to transport boats, which require sufficient disposable income. No users would be actively excluded by the alternative. During the peak summer season, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative's extension of the existing pier would increase the park's capacity for public fishing opportunities. This implies a high marginal value for the alternative. The alternative is close to multiple communities (including the towns of Grand Isle, Galliano, and Larose, Louisiana); is an approximately 1.5-hour drive from Houma, Louisiana; and would be available to a large potential visitor and recreational fishing population.

3.3.3.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and enjoyment of shoreline uses has a high likelihood of success. No land acquisition is required, and the Louisiana Office of State Parks has successfully implemented similar recreational fishing pier, a rock jetty that assists in resiliency of shoreline and park areas, and infrastructure improvement projects as part of its day-to-day park management responsibilities. The existing Grand Isle State Park has been operational since 1968 and provides access to natural resources for a regional population. The ongoing maintenance and management

of the park would not change as a result of the alternative. In fact, maintenance of some elements, such as repaired roads, would be expected to decrease as a result of using more resilient construction materials for the proposed repairs.

3.3.3.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The fishing pier extension, rock jetties, and park infrastructure improvements would be constructed along the coastline of the Gulf of Mexico and would require in-water work for placement of the rock jetties and construction of the pier. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.3.

3.3.3.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational fishing but would also provide enhanced shoreline access by adding roads and parking areas to attract more visitors that would use the park for other activities such as wildlife viewing, kayaking, and hiking.

3.3.3.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by improving the deteriorating roads, trails, and parking areas damaged by heavy equipment used to remove sand from roadways after flood events. In addition, the rock jetties would help prevent further erosion of shoreline features, including species habitats and human infrastructure.

3.3.3.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new and improved public access to trust resources that were injured by the DWH Oil Spill, and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved as they relate to existing roads and parking areas that are deteriorating.

3.3.4 Chitimacha Boat Launch

3.3.4.1 ALTERNATIVE DESCRIPTION

The Chitimacha Boat Launch alternative, submitted by the Chitimacha Tribe of Louisiana (Chitimacha Tribe or Tribe), would involve replacing the Tribe's existing boat launch, which is inadequate in size, deteriorated, and is becoming unsafe for public use. The new launch would provide a safe, larger boat launch facility to access numerous water bodies, including Bayou Teche, Lake Fausse Pointe, Lake Dauterive, Grand Avoille Cove, the Atchafalaya River Basin, West Cote Blanche Bay, and the Gulf of Mexico for fishing and recreation (Figure 3.3-4).

The alternative is located in St. Mary Parish within Chitimacha Tribal Lands, adjacent to Charenton, Louisiana. The alternative is on the south side of Bayou Teche and on the north side of Chitimacha Trail (Louisiana Highway 326). The alternative address is 3726 Chitimacha Trail, Jeanerette, Louisiana 70544.

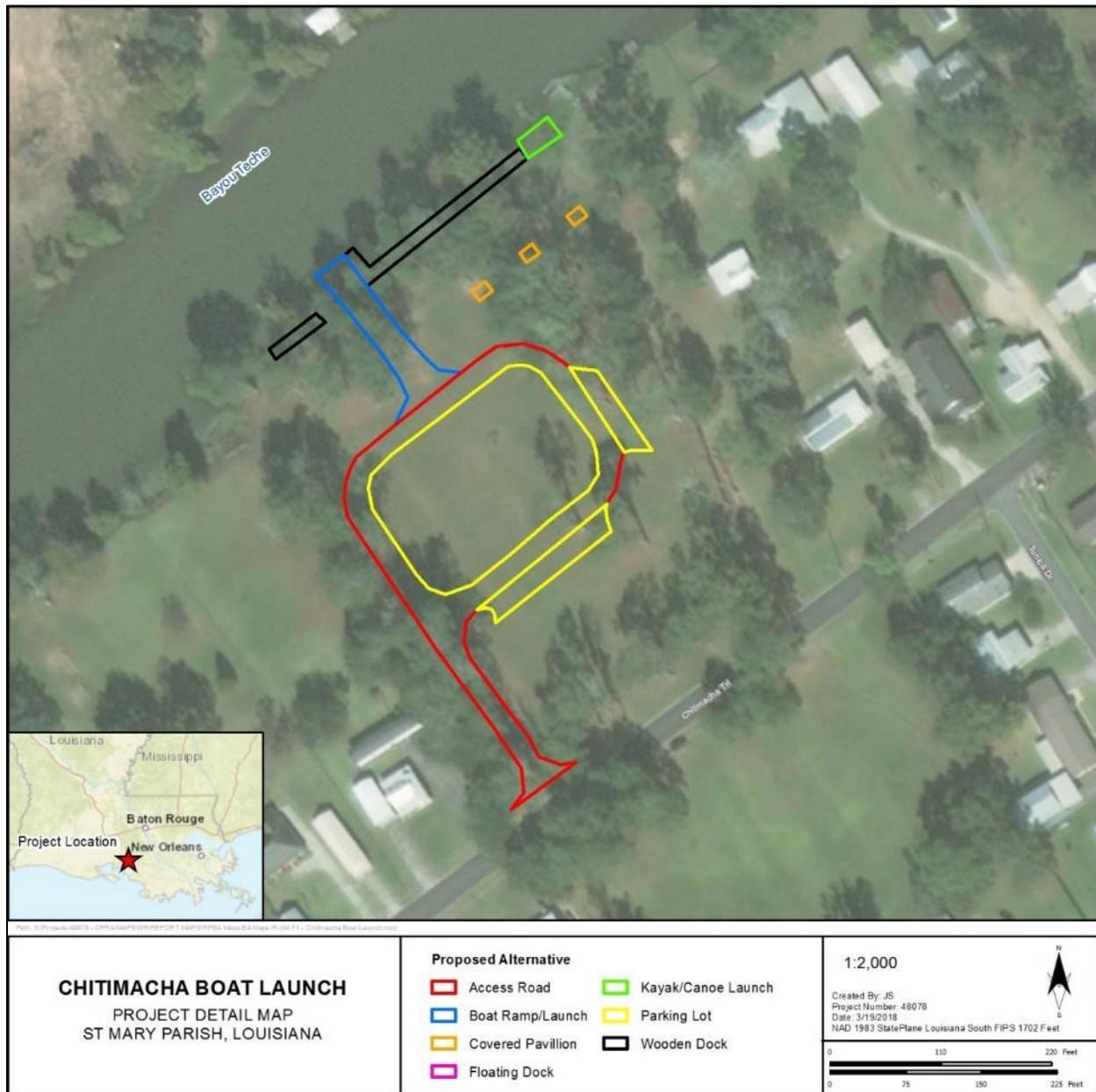


Figure 3.3-4. Location of the Chitimacha Boat Launch alternative and proposed enhancements.

3.3.4.1.1 Current and Historical Recreational Use

The Chitimacha Tribe built and opened the existing boat launch in 2001, allowing community members a safe and close site to launch their watercraft. Immediately, there was a huge demand for access to the launch, and usage has increased since. Because of land constraints, the existing boat launch was originally designed to safely accommodate eight vehicles with trailers. The limited size has created safety and congestion issues because of its popularity with fishermen and boaters. The limited size has also affected

adjacent landowners and poses a risk to accessibility for fire and police services in the event of an accident. The existing boat launch is also in need of repair but cannot be expanded because of land constraints; therefore, the Chitimacha Tribe would prefer to use funds toward a new, appropriately sized facility.

In 2017, the Tribe received a floating kayak/canoe launch and gangway through a grant with the University of Louisiana-Lafayette and the TECHE Project, which was installed on the new 5-acre tract at the site of the proposed new boat launch. The associated walking path and parking lot were constructed by the Chitimacha Tribe. This floating launch opened to the public in the fall of 2017.

The Chitimacha Tribe is looking to further expand the opportunities offered at this site. After securing additional funding, the Tribe would build picnic pavilions that would enhance the experience for boaters, motorized and non-motorized, as well as anyone who wants to enjoy scenic, historic Bayou Teche (now recognized as a National Water Trail) for fishing, picnicking, bird and wildlife watching, and other outdoor activities.

Before the existing boat launch was constructed, members of the Chitimacha Tribe and members of the surrounding community used a private launch in Charenton, Louisiana, to access Bayou Teche, Grand Avoille Cove, Lake Fausse Pointe, Lake Dauterive, the Atchafalaya River Basin, West Cote Blanche Bay, and the Gulf of Mexico. After many years of use and because of its deteriorating condition, the private boat launch in Charenton became dangerous for launching boaters, and also placed equipment in peril because of the launch's condition. For these reasons, the family that owned the private launch closed it.

3.3.4.1.2 Enhanced Recreational Use

In 2009, the Chitimacha Tribe acquired an 8-acre tract of land within the boundaries of the reservation for \$82,000. Five of these acres (the alternative) is located on Bayou Teche, a short distance from the existing Chitimacha Boat Launch. The Chitimacha Tribal Council passed a resolution in September 2012 to construct a larger, safer launch to accommodate the needs of its members and others who wish to launch at this site, and to permanently close the existing boat launch, which was deteriorating and unsafe. The alternative is ideal because of 1) its proximity to surrounding bodies of water, 2) the popularity of the existing launch, and 3) this area is patrolled both day and night by the Chitimacha Police Department who can respond quickly to any need at the launch. The Chitimacha Tribe also has its own fire department that can respond to any emergency, including via boat, at the proposed launch within minutes, and the launch is near a convenience store, which provides access to fuel (including ethanol free), food, ice, bait, and fishing supplies.

The alternative would include construction of a new boat launch on the south bank of the Bayou Teche. The existing boat launch is on another property on the Bayou Teche approximately 0.35 mile downstream of the proposed new boat launch, and it would be closed after construction of the new facility. The new boat launch would safely accommodate parking for approximately 22 vehicles with trailers. In addition, the alternative would create overflow parking capacity on contoured grassy areas adjacent to the developed parking lots. An additional figure is shown in Appendix E (Figure E-3). For planning purposes, it is assumed that the alternative would permanently impact the entire 5-acre site. Although not all vegetation is anticipated to be removed, the 5-acre site is considered the development envelope.

The new launch facility would include construction of the following:

- One 50,880-square-foot paved parking lot with ingress and egress and 22 spaces large enough to accommodate a vehicle with a trailer
- One 160-foot-long × 30-foot-wide paved boat ramp from the paved parking lot to the Bayou Teche
- One 480-square-foot floating dock constructed of treated structural lumber with composite decking
- Two wooden docks totaling 3,360 square feet, constructed of treated wood

3.3.4.1.3 Construction Methodology and Schedule

The alternative is expected to take approximately 12 months from start to finish, subject to approval of permits and environmental review. A conceptual design has already been developed. Preliminary planning and commencement activities are anticipated to take approximately 3 months. E&D are anticipated to take approximately 5 months. Contracting and pre-construction activities are anticipated to take approximately 3 months. Construction is anticipated to take approximately 4 months.

The alternative includes several features that would require vegetation removal, excavation, embankment, and grading. Roadways and parking areas would be compacted aggregate. The 1,370-square-yard concrete double boat ramp and approach apron would be designed in accordance with the permit from the U.S. Army Corps of Engineers (USACE), and the shoreline would have sidewalls to prevent erosion and to provide long-term stability, which would require removal of all riparian vegetation. Both of these features would require in-water work for installation. Docks made of treated structural lumber with composite decking are proposed to flank the boat ramp and continue along the shoreline. The dock section not reserved for boat mooring would be used for other water-oriented recreational enjoyment, which may include bird and wildlife viewing and fishing.

Vegetation would be removed along the shoreline to accommodate the dock. Two wooden docks (3,360 square feet) and one perpendicular dock (480 square feet), pending USACE approval, are also proposed. The wooden dock would also require a vinyl sheet pile bulkhead that would run parallel to the ramp and along the shoreline to prevent erosion and to provide stability. Treated timber piles would be necessary to support the dock and would be driven into the substrate. Timber piling is regularly used to construct piers, docks, buildings, walkways, and decks in aquatic and above-aquatic environments. Pressure-treated wood products are manufactured and installed in a manner that minimizes any potential for adverse impacts to aquatic environments. The piles would be driven using an impact hammer pile (vibratory hammers are not typically used on timber piles) with standard equipment (crane, boom, set of leads, pile hammer, helmet, pile gate, and pile monkey). The crane and associated equipment can be staged either onshore on a barge or in the waterway.

Other materials used for the parking lots, access roads, and footpaths would include stone base course, aggregate surface course, geotextile fabric (laid underneath proposed aggregate and stone-based surfaces), concrete wheel stoppers and pavilion materials (timber, roofing, Portland Cement Concrete Pavement [PCCP] slab, etc.), and electric dusk to dawn lighting.

3.3.4.1.4 Maintenance Requirements

The Chitimacha Tribe would be responsible for all maintenance activities and costs related to the new boat launch, including any repairs needed over the life of the facility. After the launch is constructed, the Chitimacha Tribe intends to charge a launch fee to partially fund operation and maintenance of the facility.

3.3.4.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that it is constructed as designed, and that it enhances recreational use compared with pre-alternative conditions. The Chitimacha Tribe would be responsible for performance and use monitoring and for obtaining as-built designs from the alternative engineer. Monitoring would be designed around the alternative objective to enhance and increase recreational boating and fishing opportunities by constructing a new boat launch facility. Funding for post-construction monitoring is not included in the alternative cost estimate, and would be provided by the Chitimacha Tribe. See Appendix C for the MAM plan for the alternative.

3.3.4.2 OIL POLLUTION ACT EVALUATION

3.3.4.2.1 Cost Effectiveness

The cost to implement the Chitimacha Boat Launch alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The proposed cost of the NRDA-funded portion of the alternative is approximately \$650,000 (Table 3.3-2). The alternative has gone through a preliminary design process, and further E&D are needed for alternative implementation. The land acquisition cost of \$82,000 was borne by the Tribe in 2009 for the purpose of constructing a new boat launch and is therefore not included in the cost estimate. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects.

The estimated cost for the alternative is approximately \$650,000, which includes E&D, geotechnical work, construction, materials, and a contingency fee (see Table 3.3-2). This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

Table 3.3-2. Construction Cost Estimate - Chitimacha Boat Launch Alternative

Description	Cost
Permitting, planning, environmental compliance	\$5,000
Site clearing	\$20,000
Excavation and embankment	\$50,000
Road and parking aggregate	\$94,014
Boat ramp abutment paving	\$90,048
Boat ramp	\$120,000
Vinyl sheet pile bulkhead	\$134,400
Dock framing	\$19,200
Timber decking	\$22,100
Signage	\$7,500
Security lighting	\$17,000
E&D	\$65,000
Mobilization	\$5,000
Total (NRDA funds)	\$649,262

All alternative work would be awarded in compliance with Louisiana’s public bid laws and regulations, ensuring that the alternative is constructed at current market rates. Projections of operating costs and use were based on other similar projects managed by the Chitimacha Tribe.

3.3.4.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed earlier in this RP/EA, most of the recreational use loss in Louisiana as a result of the spill was to recreational fishing. The recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational fishing experiences both by increasing visitation and enhancing the quality of future recreational visits to the area. For this reason, the alternative's goal of creating and enhancing visitor access to recreational fishing has the added benefit of providing both boat- and shoreline-based recreational activities and fishing. Therefore, the alternative has a strong nexus to the public's lost recreational fishing and access to shoreline uses. The recreational opportunities that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to the boat launch and shoreline area are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location and amenities are within the geographical footprint of the DWH recreational injury. The alternative's parking areas, boat launch, and floating dock elements are designed to be used by boat- and shoreline-based recreational anglers and aid and enhance their ability to access and interact with natural resources in the Chitimacha Reservation area.
- **Scope of benefits:** The scope of benefits for the alternative's parking areas and boat launch would be a direct function of capacity use at the boat launch and associated features and would be measured as part of the alternative's monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. However, because of a lack of public transportation in the area, benefits would likely accrue primarily to individuals who live on or near the Chitimacha Reservation and own boats and the vehicles to transport them, both of which require sufficient disposable income. The Tribe would charge a fee for using the new launch and parking area, a change from the existing launch site, which is free to use. During the peak summer season, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative's infrastructure would replace an existing deteriorated boat launch facility that is undersized and experiencing overcrowding in an area where recreational fishing is a popular activity. This implies a high marginal value for the alternative. The alternative is close to multiple communities (including the Chitimacha Reservation and the towns of Jeanerette and Baldwin, Louisiana); is an approximately 0.5-hour drive from New Iberia, Louisiana; and would be available to a large potential visitor and recreational fishing population.

3.3.4.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and enjoyment of shoreline uses has a high likelihood of success. No land acquisition is required because the Tribe already owns the property. The Chitimacha Tribe already has the capacity to maintain and operate the alternative and intends to charge a launch fee to fund the ongoing maintenance and management of the launch.

3.3.4.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The boat launch and associated facilities would be constructed adjacent to the Chitimacha Trail along the Bayou Teche and would require both excavation and grading

as well as in-water work for placement of the boat ramp, bulkheads, and docks. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.4.

3.3.4.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational fishing; however, the alternative would also provide enhanced shoreline access and wildlife viewing. Bank stabilization would be another benefit of the alternative because of the proposed construction methods for the new launch and the decommissioning of the existing launch.

3.3.4.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by closing the existing boat launch and replacing it with the proposed boat launch. The existing boat launch is deteriorating and needs repairs and safety improvements. It does not provide adequate space for parking of vehicles and boat trailers, and the overcrowding presents safety hazards for parked vehicles and ingress and egress activities. To minimize public health impacts, the Chitimacha Tribe would provide routine trash collection and removal services at the 5-acre alternative.

3.3.4.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new and improved public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.5 Sam Houston Jones State Park Improvements

3.3.5.1 ALTERNATIVE DESCRIPTION

The Sam Houston Jones State Park Improvements alternative was submitted by the Louisiana Office of State Parks. The alternative would involve three elements intended to improve the recreational camping experience and increase visitor retention to participate in additional recreational opportunities (e.g., fishing): 1) replacing 10 trailer cabins with state park standard cabins, 2) renovating the interior and exterior of a day-use area restroom, and 3) constructing a new restroom to address an underserved area of the park at a popular trailhead. The alternative would provide improved camping and day-use facilities for increased recreational use of the Sam Houston Jones State Park, benefiting public visitors' recreational experience.

The alternative is located in Calcasieu Parish about 3.8 miles north of the City of Westlake along the north bank of the Calcasieu West Fork River (Figure 3.3-5). The alternative is located entirely within the Sam Houston Jones State Park property, specifically near the southwest portion of the Sam Houston Jones State Park Road that loops through the main portion of the park and is accessible from Sutherland Road. The alternative address is 107 Sutherland Road, Lake Charles, Louisiana 70611.

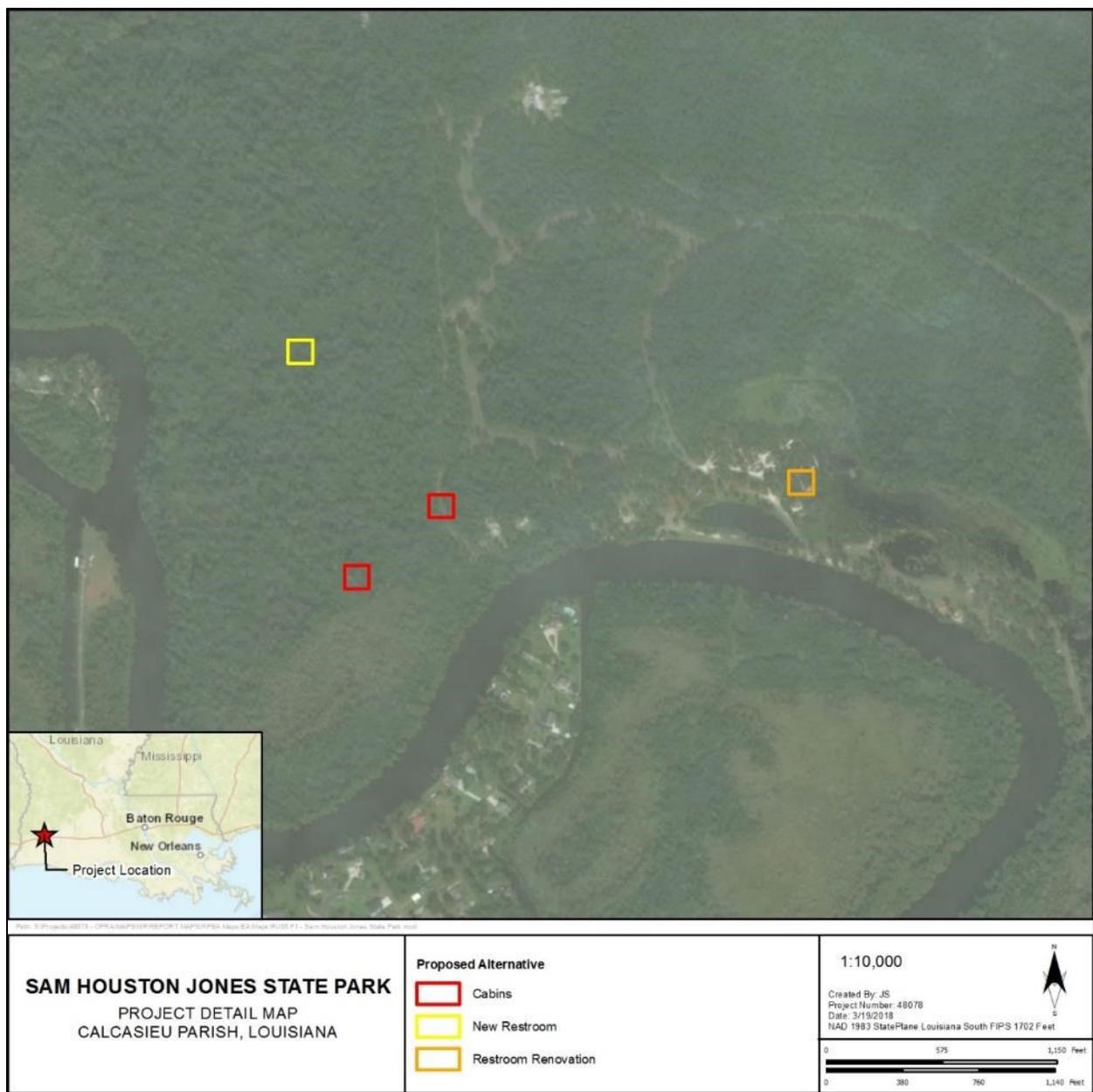


Figure 3.3-5. Location of the Sam Houston Jones State Park Improvements alternative.

3.3.5.1.1 Current and Historical Recreational Use

The State of Louisiana established the 1,087-acre site that became the Sam Houston Jones State Park (originally called the Sam Houston State Park) in 1944. Recreational opportunities within the park include campsites, cabins, a picnic area with pavilions, a playground, multiple restrooms, two boat launches located on the West Fork of the Calcasieu River with access to Lake Charles and the Gulf of Mexico, boat rentals, three hiking trails, bird watching, fishing, and a disc golf course.

Most of the old cabins within the park were replaced with temporary trailer cabin units when they were determined to be beyond repair and the Louisiana Office of State Parks could not afford to replace cabins with in-kind models. The temporary trailer cabins did not meet expectations when purchased and are currently deteriorating faster than originally projected and need to be replaced to maintain adequate lodging for visitors. The availability of cabins within the park allows visitors to stay longer and participate in more recreational opportunities, such as fishing, bird and wildlife viewing, hiking, and biking.

Restrooms are an important element for retention of visitors as they are less likely to visit or stay at a park if restrooms appear unsanitary or if there are not enough restrooms to serve the public need. The Louisiana Office of State Parks has identified one restroom that is in dire need of renovation and the need for an additional restroom in an underserved area of the park.

3.3.5.1.2 Enhanced Recreational Use

The Louisiana Office of State Parks is pursuing the alternative to replace and upgrade existing recreational infrastructure and service facilities within the Sam Houston Jones State Park to improve the recreational camping experience and increase visitor use. The alternative would achieve this goal by replacing 10 existing temporary trailer cabins that are deteriorating, remodeling the interior and exterior of an existing outdated restroom, and building a new restroom in an underserved area of the park. Each of these elements would help achieve the alternative goal and would likely increase park visitation and enjoyment of recreational activities such as fishing. The new and remodeled structures would be updated to have a similar architectural style to match the park design and would also improve ADA accessibility.

The new and remodeled Sam Houston Jones State Park cabins and restrooms would include the following construction elements:

- Removal of 10 trailer cabins with an average size of 800 square feet
- Construction of 10 state park standard cabins with an average size of 1,100 to 1,200 square feet, each using existing utility infrastructure, including some landscaping around each of the new cabins
- Repair of existing cabin parking and walkway paving for access to cabins
- Replacement of interior finishes and fixtures and repair of exterior rot and weather proofing at an existing approximately 900-square-foot restroom
- Construction of a new approximately 750-square-foot restroom
- Extension of existing park utilities to serve the new restroom

3.3.5.1.3 Construction Methodology and Schedule

A conceptual design for the alternative has been developed. The alternative construction schedule would be determined during E&D, but it is estimated that if work is done concurrently, all work would be completed in 20 to 22 months and if the work is done sequentially it would take approximately 46 months to complete the alternative. All work would be subject to approval of permits and environmental review. The construction schedule would include contracting and pre-construction and construction activities. The construction methodology for each of the three alternative elements are described below.

To construct the 10 replacement cabins, the existing temporary trailer cabins would be removed to accommodate the new approximately 1,100 to 1,200-square-foot state park standard cabins. Minimal site preparation and utility work would be needed because the replacement cabins would occupy the same

footprint as the existing cabins and would tie into existing utility lines. The new cabins would be standard stick construction with 2 × 4 stud framing. Special wood alternatives and ground barriers may be required where Formosan termites (*Coptotermes formosanus*) are present. Cabins would be built either on a pier and beam or concrete slab foundation, depending on grade. Interior finishes would be simple and rustic and able to withstand frequent visitor usage. Additionally, some improvements may be required to the surrounding grounds, including improvements to the parking and access walkways and landscaping around the new cabins to restore construction impacts. Any improvement to vehicular paving would match the existing pavement, which is asphalt with a crushed stone base. Walkways would be concrete with a minimum width of 3 feet and would likely include ADA-compliant access. It is anticipated that 8 months would be needed to complete the design phase of the alternative and 12 months for construction.

Renovation of the existing 900-square-foot restroom would include the replacement of all interior finishes and fixtures, as well as repairs to some exterior areas that have wood rot and old weather proofing. Interior finishes would include sinks, toilets, mirrors, toilet partitions, lights, hand dryers, and some tile on the floor and walls. Repairs to the exterior would mostly be limited to exposed roof elements, such as the soffit and large timber accent pieces. It is anticipated that 3 months would be needed to complete the design phase of the alternative and 7 months for construction.

Construction of the new approximately 750-square-foot restroom facility would require at least three toilets and sinks for each of the two sides of the restroom facility to meet the anticipated user needs. Construction methods and architectural style would match existing park restroom and bathhouse facilities. In addition, existing park utilities would be extended to serve the new restroom and would be located in buried lines. Water and electrical lines would be extended by 950 feet and the sewer line would be extended by 1,200 feet. It is anticipated that 6 months would be needed to complete the design phase and 10 months for construction.

3.3.5.1.4 Maintenance Requirements

The Louisiana Office of State Parks is currently responsible for park maintenance and would continue to be responsible for all maintenance activities and costs related to the new and improved structures, which would include the new cabins, a remodeled restroom, and new restroom or comfort station facilities, as well as any repairs needed over the life of these structures. After construction of the alternative elements, operators currently servicing the park and fees associated with the park, including camping fees, would not be expected to change from the current system.

3.3.5.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that all alternative elements are constructed as designed, and that the alternative enhances recreational use compared with pre-alternative conditions. The Louisiana Office of State Parks would be responsible for performance and use monitoring and for obtaining as-built designs from the alternative engineer. Monitoring would be designed around improving recreational use of the park through the improvement of cabin and restroom facilities' availability and quality. Funding for post-construction monitoring is not included in the alternative cost estimate, and would be provided by the Louisiana Office of State Parks. See Appendix C for the MAM plan for the alternative.

3.3.5.2 OIL POLLUTION ACT EVALUATION

3.3.5.2.1 Cost Effectiveness

The cost to implement the Sam Houston Jones State Park Improvements alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The proposed cost of the alternative is \$2,425,250 (Table 3.3-3). The alternative has gone through a preliminary design process, and further E&D are needed for alternative implementation. The alternative would be implemented entirely within an existing state park with existing camping and use fees to fund the operation and maintenance of the park. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects.

The estimated cost for the alternative is \$2,425,250, which includes E&D (including pre-construction testing and surveys), construction, and materials for each of the alternative elements (see Table 3.3-3). This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

Table 3.3-3. Construction Cost Estimate - Sam Houston Jones State Park Improvements Alternative

Description	Cost
Replacement Cabins Subtotal	\$1,943,750
Construction and materials	\$1,555,000
E&D	\$388,750
Restroom Renovation Subtotal	\$106,500
Construction and materials	\$85,200
E&D	\$21,300
New Restroom Subtotal	\$375,000
Construction and materials	\$300,000
E&D	\$75,000
Total (NRDA funds)	\$2,425,250

All alternative work would be awarded in compliance with Louisiana’s public bid laws and regulations, ensuring that the alternative is constructed at current market rates. Projections of operating costs and use were based on other similar projects managed by the Louisiana Office of State Parks.

3.3.5.2.2 Trustee Restoration Goals and Objectives

The alternative has a nexus to the DWH recreational injury. Louisiana Trustees have identified lost recreational fishing opportunities as the most significant impact to recreational use in the state. The LA TIG also identified merits of increasing and enhancing the public’s ability to access a variety of recreational resources such as fishing, beach going, camping, and boating in the screening process for this RP/EA. In addition, this inland restoration site addresses lost recreational opportunities that occurred statewide because people in non-coastal areas cancelled trips to the coast during closures related to the DWH Oil Spill. The recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational opportunities through the improvements of infrastructure supporting the use of the state park's existing boat launch, such as overnight campgrounds and day-use restrooms, which would likely increase visitation and enhance the quality of future recreational visits to the area. For this reason, the alternative's goal of creating and enhancing visitor access to shoreline uses, including recreational fishing, has the added benefit of providing additional terrestrial recreational opportunities. Although the alternative is located inland from the Gulf Coast, the boat launch on the Calcasieu West Fork has access to the Gulf of Mexico through major recreational water bodies, such as Lake Charles and Calcasieu Lake. Therefore, the alternative has a nexus to the public's lost access to shoreline uses. The recreational opportunities that would be created by the alternative are similar to shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access) and are in keeping with criteria used in this RP/EA for recreational use alternative selection (merits of increasing and enhancing the public's ability to access a variety of recreational resources such as fishing, beach going, camping, and boating). Visitors to the boat launch would likely be the same regional user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- Component benefits: The alternative's location and amenities are inland of the coastal areas directly affected by the DWH recreational injury, but the alternative benefits would support the use of areas within the geographical footprint of the DWH recreational injury. The alternative's cabin and restroom improvement elements are designed to improve the overall use of the park by improving park amenities to support boat- and shoreline-based recreational anglers and other recreational users.
- Scope of benefits: The scope of benefits from the alternative's increased shoreline access would be a direct result of cabin and restroom improvements that encourage and increase capacity use at the boat launch and associated features and would be measured as part of the alternative's monitoring plan.
- Public access: The recreational benefits of the alternative would be broadly available to the public. However, because of a lack of public transportation in the area, benefits would likely accrue primarily to individuals who live within a reasonable driving distance of the Sam Houston Jones State Park and who own vehicles, which requires sufficient disposable income. No users would be actively excluded by the alternative. During the peak summer season, cabin and parking capacity may limit the total benefits available.
- Location: The alternative's infrastructure improvements would replace or renovate existing deteriorated cabins and restrooms and construct an additional restroom at an underserved area of the park. This implies a moderate marginal value for the alternative. The alternative is close to multiple communities (including the City of Lake Charles, Louisiana, and surrounding towns); is less than a 0.5-hour drive from Lake Charles, Louisiana; and would be available to a large potential visitor and recreational fishing population.

3.3.5.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and enjoyment of shoreline uses (including camping and hiking) has a high likelihood of success. No land acquisition is required, and the Louisiana Office of State Parks has successfully implemented similar recreational cabin and restroom improvements in support of existing boat launches as part of its day-to-day park management responsibilities. The existing Sam Houston Jones State Park has been operational since 1944 and provides access to natural resources to a regional population. The ongoing maintenance and management of the park would not change as a result of the alternative.

3.3.5.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The cabin and restroom improvements in support of the park's existing boat launch would be constructed within the Sam Houston Jones State Park and would require work entirely in uplands. All work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.5.

3.3.5.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to enhance recreational fishing access but also to enhance terrestrial camping recreational opportunities and enhance park enjoyment through improved services (restroom facilities)

3.3.5.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by improving cabin and restroom quality in support of the existing boat launch. The existing trailer cabins are deteriorating, and restroom facilities are becoming unsanitary and do not meet the current demand. The proposed replacement cabins, restroom renovations, and new restroom facility would improve the overall health and safety of the park.

3.3.5.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. Although the alternative is located inland, the boat launch on the Calcasieu West Fork has access to the Gulf of Mexico through major recreational water bodies and would provide fishing and water-based recreational opportunities. Furthermore, this inland restoration site addresses lost recreational opportunities that occurred statewide because people in non-coastal areas cancelled trips to the coast during closures related to the DWH Oil Spill. The alternative would provide improved infrastructure for public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.6 *Pointe-aux-Chenes Wildlife Management Area Recreational Use Enhancement*

3.3.6.1 ALTERNATIVE DESCRIPTION

LDWF is proposing multiple recreational improvements in the Point-aux-Chenes WMA, which is located on lands owned and managed by LDWF. The Pointe-aux-Chenes WMA is located in Terrebonne and Lafourche Parishes, between the towns of Galliano and Montegut and bisected by the town of Pointe-aux-Chenes.

The Pointe-aux-Chenes Wildlife Management Area Recreational Use Enhancement alternative would consist of four discrete elements: 1) pirogue pullovers, 2) a pirogue launch, 3) fishing piers at water control structures, and 4) and a boat launch renovation (Figure 3.3-6). These activities are planned to occur within the Montegut, Point-aux-Chenes, and Grand Bayou Management Units of the WMA, as well as the designated limited access areas (LAA). The proposed alternative elements are primarily intended to enhance recreational access and provide improved recreational facilities for fishing, hunting, and boating.

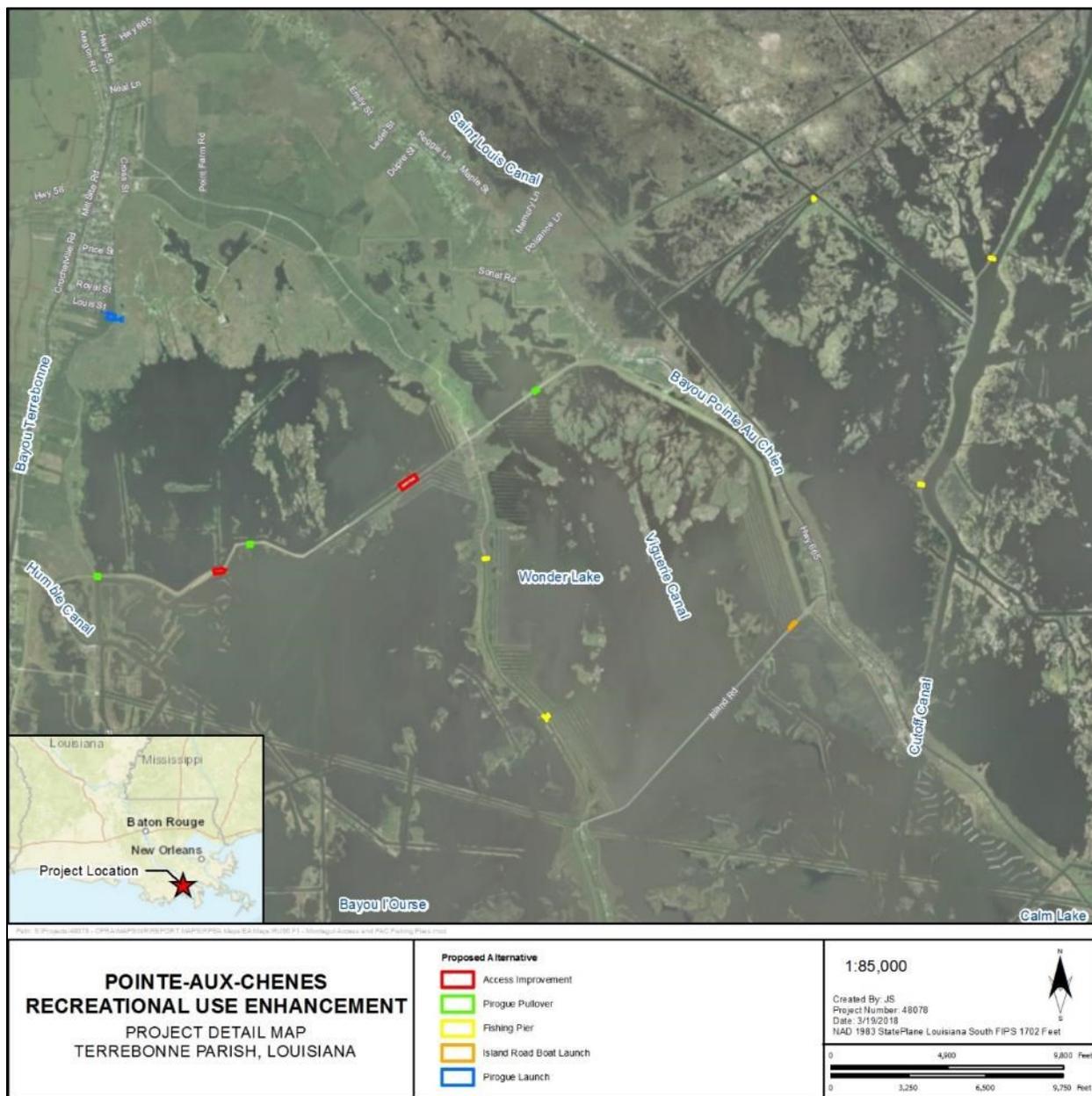


Figure 3.3-6. Location of the Pointe-aux-Chenes Wildlife Management Area Recreational Use Enhancement alternative.

3.3.6.1.1 Current and Historical Recreational Use

The Point-aux-Chenes WMA is an approximately 35,000-acre marsh area that was purchased by LDWF in 1968 from the Humble Oil Company. Approximately 40% (13,855 acres) of the WMA is under active management by LDWF, and is broken up into multiple water management units (Montegut, Pointe-aux-Chenes, Grand Bayou 1 and Grand Bayou 2 Units). These management units were established to control water and salinity levels to protect sensitive marsh habitat for wildlife and recreational uses.

This WMA is accessible by boat or by paved road (State Route 665 and 55). The WMA headquarters facility is staffed 7 days a week to assist the public and enhance recreational opportunities. The Grand Bayou boat launch provides access to the St. Louis Canal and the Grand Bayou Unit, and a boat launch along the Island Road provides access to the Pointe-aux-Chenes Unit. Both launches are accessible by State Route 665. There is a primitive public campground on the WMA located across State Route 665 near the WMA headquarters, with two nearby wildlife observation towers.

The Pointe-aux-Chenes WMA is a highly popular destination for recreational fishing and waterfowl hunting due to its habitat quality and public accessibility. Other common recreational activities include boating (motorized and non-motorized depending upon restrictions), birdwatching, and photography. The WMA receives roughly 30,000 recreational visitors annually (LDWF 2014).

3.3.6.1.2 Enhanced Recreational Use

As noted above, LDWF is proposing to develop four discrete recreation enhancements on lands owned and managed by LDWF in an effort to enhance recreational experiences of public users in the Point-aux-Chenes WMA. These elements are detailed below.

Pirogue Pullovers

Three new pirogue pullover structures would be constructed across the Morganza to the Gulf Hurricane Protection Reach of the J-2 Levee. These pullovers would be located in the Montegut and Point-aux-Chenes Units of the WMA, but also within the designated LAA. These structures would typically consist of an aluminum or other light-weight material framework that could be used to ease the effort of pulling non-motorized boats (pirogues) over the levee. Local fill material would be used on both sides of the levee at both pullover locations. A winch system would be installed on the western-most pullover to aid boaters in hauling their equipment over the levee, depending on site conditions. Because this levee is still under construction and would need continuous maintenance, these structures would be designed for relatively simple installation and dismantling for levee maintenance events. Preliminary plans are shown in Appendix E, Figure E-4.

Pirogue Launch

A new pirogue launch site would be constructed into the Montegut Unit of the WMA, but also within the designated LAA near the south end of the town of Montegut. Primary land access to the site would be through Wilderness Street (public roadway) in Montegut. Preliminary plans are shown in Appendix E, Figure E-5.

The alternative features would include the following:

- A new 20-foot-wide × 270-foot-long graveled access road. This access road would extend eastward from Wilderness Street to a new graveled parking lot. This would require clearing approximately 3,240 square feet of upland area along the new access road.
- A 1.5-acre (200 feet wide × 320 feet long) graveled parking lot within the WMA boundary. This area is vegetated and would be cleared prior to construction.

- A bridge over the Montegut canal and levee into the adjacent marsh. The bridge would be a 20-foot-wide × 290-foot-long bridge and pier system over the existing Montegut Canal that would extend up and over the levee to open water east of the levee. At the east end of the bridge, two new piers would be constructed for hunters and anglers to dock their pirogues. These piers would be 6 feet wide, oriented north-south, extend 100 feet to opposite sides of the main bridge/pier, and then continue 44 feet east. The construction of the bridge would be fiberglass grating over wood piling supports.

Fishing Piers at Water Control Structures

New pier-supported docks and articulated concrete block walkways would be constructed at two locations in the LAA of the Montegut Unit. These new features would be collocated with existing water control structures along the J-2 Levee. At both sites, new 96-foot-long × 8-foot-wide docks supported by timber piers would be constructed on each side of the existing water control structure (totaling 4 pier-supported docks at each site) as shown in Appendix E, Figure E-6. New 8-foot-wide articulated concrete block walkways would be extended to the new docks from the existing walkways on top of the J-2 Levee. The new concrete block walkways would range from 80 to 120 feet in length.

Public docks would be constructed adjacent to water control structures at five locations in the WMA. The alternative would construct four new docks at each of the five locations, 20 feet from each water control structure, creating a total of 20 docks built for use by anglers. Preliminary plans are shown in Appendix E, Figure E-7. All of the docks would be 8 feet wide, and range from 50 to 120 feet long. The docks would be constructed using a fiberglass grating as deck material, and elevated on wood pile supports.

Island Road Boat Launch Renovation

Repairs would be conducted at the existing Pointe-aux-Chenes Island Road Boat Launch to improve public user access. Boat launch repairs would include:

- New concrete boat launch/ramp
- Repairs or replacement to the bulkhead surrounding the parking lot (approximately 370 linear feet)
- Two new boat docks/piers
- New parking lot lighting
- Dredge out silted-in access canal (approximately 3,000 feet) along the Island Road. Spoils would be beneficially placed in water to construct marsh terraces. Terraces would have 50-foot gaps between them.

3.3.6.1.3 Construction Methodology and Schedule

The construction schedule has not yet been set, and would be determined during final design. Construction of the alternative elements varies, but similar activities would typically take 12 to 18 months to complete. Construction methods for the discrete elements described above could overlap to varying degrees depending upon the constructed elements. This section describes how similar alternative elements would likely be constructed. Construction of the alternative would include use of standard construction and earth moving equipment such as bulldozers, excavators, trucks, backhoes, cranes, barges, amphibious excavators, generators, and pile drivers.

Piers, Docks, and Pilings

Planned piers and docks would be constructed on treated timber. Pilings would typically be capped with plastic. Piers and docks would be supported on a parallel series of timber pilings. Timber pilings are typically set in place by a crane or boom, and driven into place with using a pile hammer (vibratory hammers are typically not used on timber piles). The crane or boom and associated equipment would operate from the landward side where possible, or staged on a barge. Pier and dock framing would likely be pressure-treated, marine-grade dimensional wood. Piers and docks are anticipated to be surfaced with fiberglass decking.

Pirogue Pullover Structures

Pullover structures would be constructed from lightweight aluminum (or similar material), and would consist of a cradled track on which to drag the pirogue. If placed on natural soil, e.g., the levee, pullovers would require filling with native material (if suitable) or off-site fill to ease the grade at which the pullover rests. Pullovers situated on the levee would not be deeply anchored, in order to make them removable for levee maintenance.

Fill and Backfilling

Alternative elements requiring fill material such as the boat launch, or backfilling such as may be required for bulkheads, would use locally sourced material where appropriate. Standard construction equipment would be used for all excavation, moving, spreading, and compacting of fill material. Fill activities and fill material used at levee locations would be conducted by the Levee District and hauled in from a USACE-approved location.

Dredging and Dredge Spoils

Dredging would be conducted using standard dredging methods, which typically include a bucket-style dredge. Dredge locations are not typically along the shoreline, so dredges are anticipated to be barge-mounted units. Dredge spoils would typically be deposited in water in areas adjacent to the dredging location. Dredge spoils could be used as backfill behind bulkheads in some areas depending on site needs and conditions. Dredge spoils may also be piled up above the existing waterline to create marsh terraces. These earthen marsh terraces are expected to offset any wetland mitigation requirements of the alternative and enhance boating access.

Clearing

Upland, shoreline, and aquatic vegetation would be removed only in areas required for construction. Cleared vegetation would be removed from the site and disposed of at an approved location. Debris and/or previously existing man-made material would be removed as needed and disposed of at an approved location.

Access Roads and Parking Areas

Access roads and parking areas would be graded and surfaced as appropriate to their use (asphalt, gravel, concrete). All rights-of-way would be obtained prior to construction. Vegetation would be removed from the rights-of-way as needed. These areas would be contoured to allow adequate drainage.

Bulkheads

Typical bulkhead installations include interlocking sheet pile (steel, aluminum, vinyl, or composite material based on site conditions) that are driven directly into the sediment. If wood pilings are used as bulkheads they would typically be driven into the sediment, and include sheeting material (e.g., treated lumber) placed behind the pilings. Because the piles or sheet piling would be installed in water, typical installation would likely occur from a boat- or barge-mounted impact or vibratory hammer system. Bulkheads may also include a combination of timber pilings, sheet pile, and backfill. The depth of bulkheads below the substrate, location of bulkheads relative to the shoreline, and amount and type of backfill would be based on site conditions and determined during design.

Articulated Concrete Block Walkways

Articulated concrete blocks would be used to create pedestrian walkways at some of the alternative locations. These features would be a matrix of individual concrete blocks placed together to form an erosion-resistant overlay. The flexible, interlocking matrix is formed from concrete blocks of uniform size, shape, and weight. Each block is interconnected with adjacent blocks by a series of cables. These walkways would be designed for pedestrian traffic but prevent erosion and allow vegetation to grow throughout the entire system. The walkways would likely be transported along the levee road to each site, or by barge if no road is available, and set in place by crane or boom. This task would not likely require notable vegetation removal because the articulated walkways are designed to mold to the existing topography. Minor cut/fill may be required to make the walkways pedestrian friendly.

Boat Launch

The boat launch would be constructed from prefabricated concrete panels laid in place by crane from the landward side of the boat ramp. Boat ramps would have a concrete apron supported with multiple timber pilings at the upper end to anchor the prefabricated boat ramp panels. Concrete-filled steel bollards would be installed at either side of the boat ramp to prevent driving off the edge.

3.3.6.1.4 Maintenance Requirements

As the owners and managers of the Point-aux-Chenes WMA, LDWF would be responsible for maintenance activities and repair costs over the life of the alternative's new facilities.

3.3.6.1.5 Monitoring Requirements

Monitoring would occur throughout construction to verify that the alternative is constructed as designed and that it would enhance recreational uses. Post-construction performance monitoring is not included in the alternative cost estimate and would be the responsibility of LDWF for 1 year. Monitoring schedules are anticipated to be adaptive based on long-term alternative performance, e.g., seasonal monitoring may be needed if use is low and repairs are rare, or more frequent monitoring if use is high and repair needs are common. See Appendix C for the MAM plan for the alternative.

3.3.6.2 OIL POLLUTION ACT EVALUATION

3.3.6.2.1 Cost Effectiveness

The costs to implement the features proposed in the alternative are reasonable, appropriate, and comparable to other equivalent restoration alternatives. The total estimated construction costs for improvements at all four alternative elements is \$5,012,000 (NRDA funds), with a range of roughly \$182,000 to \$1,400,000 per element depending upon size, location, and complexity.

The alternative has gone through a preliminary design process, and further E&D are needed for alternative implementation. The land required for the alternative is owned or leased by LDWF with minor amounts of additional public right-of-way to be acquired. Permission from landowners has been secured on leased properties. No new in-fee land acquisitions would be required. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects. The cost estimate of \$5,012,000 would be for construction only, and does not include future funds for operation, maintenance, or monitoring.

All work would be awarded in compliance with Louisiana's public bid laws and regulations, ensuring that the alternative is constructed at current market rates. Projections of operating costs and use were based on other similar projects managed by LDWF.

3.3.6.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. Most of the recreational use loss in Louisiana as a result of the spill was to recreational fishing; however, the recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of multiple shoreline uses and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, fishing, and hunting and take place from the shoreline or from shoreline structures such as piers and docks. Boating refers to a variety of recreational boating activities that begin at sites providing access to saltwater near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance a wide variety of recreational opportunities in the Point-aux-Chenes WMA by developing features that enhance shoreline uses such as fishing, hunting, boating, etc. Therefore, the alternative has a strong nexus to the public's lost recreational fishing and access to shoreline uses.

The recreational opportunities that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of hunting, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors accessing the proposed recreation enhancements at the WMA are the same user population that the DWH Oil Spill affected, and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location and amenities are within the geographical footprint of the DWH recreational injury. The alternative's new pirogue pullovers and launch, new fishing piers, and renovated boat launch are designed to be used by boat- and shoreline-based recreational anglers, hunters, and boaters, which would aid and enhance public users' ability to access and interact with natural resources in the WMA.
- **Scope of benefits:** The alternative would directly benefit a broader range and increased number of users in the areas near the WMA, by both creating new publicly accessible recreation facilities and enhancing the quality of existing facilities. These benefits would improve user access to shoreline activities and provide additional recreational access opportunities. Increased recreational use would be measured as part of the alternative monitoring conducted by LDWF.
- **Public access:** The recreational benefits of the alternative would be broadly available to new fishing piers adjacent to public roadways.

- **Location:** Existing infrastructure primarily includes State Route 665 and Island Road, which bisects the WMA. Because the area is already highly used for recreational activities, the alternative elements would imply a high marginal value for the alternative. The alternative is located 15 miles south of Houma and generally adjacent to Montegut, and would be easily available to these communities, as well as several other nearby communities.

3.3.6.2.3 Likelihood of Success

The alternative's goal of improving recreational access and opportunities throughout the WMA has a high likelihood of success because no land acquisition is required, and LDWF has successfully implemented similar improvement projects throughout Louisiana in similar environments. LDWF constructs, operates, monitors, and maintains similar facilities as part of its day-to-day natural resource management responsibilities. Construction methods for the alternative would follow standard methods used by LDWF to construct similar facilities in similar environments.

3.3.6.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. Many of the constructed features of the alternative would be constructed in open water or vegetated shoreline areas; however, all in-water work and work in vegetated shoreline areas would be conducted in compliance with federal, state, and local laws and regulations. Upland disturbances to soils and vegetation would be limited to those recreational areas (parking lots, access roads, pier landings, etc.) directly developed or being improved. In-water work such as bulkhead installation and dredging would be implemented only in the recreational areas where these types of facilities are needed. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.6.

3.3.6.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational fishing and boating, but the alternative would also provide enhanced shoreline access for waterfowl hunting and wildlife viewing. Marsh terracing with dredged sediments would also provide a benefit for nearshore coastal habitats. Bulkheads at the renovated boat launch would improve shoreline stability.

3.3.6.2.6 Public Health and Safety

Public health and safety are expected to be benefit from improved public facilities, and enhanced public access through construction of new pirogue pullovers and launch, a renovated boat launch, and new fishing piers. The new boat docks would improve public boat mooring conditions and provide safer access to the shoreline. Dredging at the renovated boat launch area would improve boater navigation and safety. Bulkheads at the renovated boat launch would improve shoreline stability for public users. Adverse impacts to public health and safety are not expected to result from the alternative. To minimize public safety hazards, LDWF would monitor and maintain each feature as needed.

3.3.6.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are reasonable, comparable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide boating and shoreline access to trust resources that were injured by the DWH Oil Spill, and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.7 WHARF Phase 1

3.3.7.1 ALTERNATIVE DESCRIPTION

The WHARF (Wetlands Harbor Activities Recreational Facility) Phase 1 alternative, submitted by the City of Westwego, is located in Westwego, Louisiana, at an old airport site (Figure 3.3-7). The alternative would involve construction of a boardwalk along an existing canal for fishing and wildlife observation, construction of fishing piers, installation of lighting poles, construction of restroom facilities, and the construction of an on-site sewage treatment plant or connection to an off-site sewage collection system. Future phases may include developing additional areas for kayak and boat launches, an activity center, multi-purpose center with meeting facilities, RV camping, and cabins. The alternative would provide access to numerous water bodies from the Dugues Canal, including Bayou Segnette, Lake Cataouatche, Lake Salvador, Jean Lafitte National Historical Park and Preserve, and nearby game management areas.

The alternative is located southwest of downtown New Orleans, across the Mississippi River, in Jefferson Parish. The alternative site is an old airport on the south side of Lapalco Boulevard, approximately 1 mile east of the Bayou Segnette State Park, along Van Ness Drive, Westwego, Louisiana 70094.



Figure 3.3-7. Location of the WHARF Phase 1 alternative.

3.3.7.1.1 Current and Historical Past Recreational Use

The Westwego Airport served the oil field industry for decades. While in operation, the airport included a full-time fixed-base operator, several hangars and both 5,300 linear feet of wet and 4,200 linear feet of dry airstrips to accommodate both seaplane and conventional aircraft. The airport provided services and transported personnel to the oil industry’s myriad facilities located along the coast of Louisiana. The airport was closed in the early 1990s after an abrupt downturn in the oil industry. Closure of the airport has left the property dormant. Nearly all of the site is outside of the West Jefferson Levee Protection System, except for the small portion that fronts Lapalco Boulevard. The site consists of disturbed and undisturbed wetlands. A jurisdictional determination provided by USACE in 2014 identified most of the alternative as wetland, subject to CWA Section 404 and Rivers and Harbors Act Section 10 permitting (USACE 2014).

After closure of the Westwego Airport, the site has suffered from vandalism and trash dumping. The City of Westwego purchased the 132-acre land parcel for \$2,500,000 and has made committed efforts to mitigate trash dumping and abuse of the site. All buildings were removed from the site prior to the city purchasing the property, including all hangers and mobile homes; however, some concrete foundations from these structures still remain. In addition, oil operations and infrastructure at the south end of Van Ness Drive remains active. Although it is overgrown with vegetation, the public currently uses the area for fishing in the enclosed wet runway as well as the adjacent Dugues Canal.

3.3.7.1.2 Enhanced Recreational Use

The alternative is ideal because of its proximity to surrounding water bodies, because of the length of its shoreline, and because it is already being used by members of the public for shoreline fishing. Just west of the alternative, Bayou Segnette offers the opportunity for a thriving tour boat business that brings visitors to the cypress swamps. The alternative would include the construction of a boardwalk along the existing canals for fishing, fishing piers, restroom facilities, and on-site or off-site sewage treatment plant or sewage connection, as well as installation of lighting poles. The fishing pier would provide access from the alternative to the waterside for shoreline fishing. The boardwalk would provide pedestrian access from the upland parking and restroom areas as part of the overall water-oriented recreational enjoyment, which may include bird and wildlife viewing and fishing. These alternative elements would create new recreational opportunities for the public within the Bayou Segnette watershed and improve access to fishing opportunities and other water-based recreational activities.

The alternative would include the following elements:

- Recreational enhancement construction, including the following actions:
 - Construction of an approximately 1,200-foot-long × 6-foot-wide boardwalk
 - Construction of four approximately 12 × 20-foot fishing piers
 - Installation of approximately 30 20-foot-tall aluminum lighting poles
 - Construction of small on-site sewage treatment plant or sewer connection to adjacent off-site sewer collection system
 - Construction of restroom facilities

3.3.7.1.3 Construction Methodology and Schedule

The alternative is expected to take approximately 2 to 3 years from start to finish, subject to approval of permits and environmental review. A conceptual design has already been developed. Preliminary planning and commencement activities are anticipated to take approximately 3 months. E&D are anticipated to take approximately 9 months. Contracting and pre-construction activities, such as permitting, are anticipated to take approximately 6 months. Construction is anticipated to take approximately 18 months.

Excavation would occur along the riparian area for the boardwalk and fishing piers and in the upland terrestrial environment for the restrooms and sewer system. The depth of ground disturbance and excavation would depend on final design. This site preparation would include some tree removal and grubbing of roots in areas requiring vegetation clearing.

The approximately 1,200-foot-long and 6-foot-wide wooden boardwalk and four approximately 12 × 20-foot fishing piers are proposed along the Dugues Canal and would require in-water work for installation. Timber piling supports and composite deck materials would be used to construct piers and boardwalks in and above aquatic environments. Pressure-treated wood products are manufactured and installed in a manner that minimizes any potential for adverse impacts to aquatic environments. The piles would likely

be driven using an impact hammer pile (vibratory hammers are not typically used on timber piles) with standard equipment (e.g., crane, boom, set of leads, pile hammer, helmet, pile gate, and pile monkey). The crane and associated equipment would likely be staged onshore.

Other alternative elements would be constructed in wetland and upland areas where vegetation clearing and site grading occurred. These include the construction of the restroom facilities and installation of lighting poles. Construction of these elements would include laying concrete foundations, structure framing, exterior and interior finishes, and landscaping, including the construction of pedestrian paths between structures and parking areas. Installation of the lighting poles would likely include the installation of approximately 30 20-foot-tall aluminum poles and extension of underground utilities. In addition, either a small on-site sewage treatment plant would be installed or sewage would be pumped to an adjacent sewer connection system and treated off-site.

3.3.7.1.4 Maintenance Requirements

The City of Westwego would be responsible for all maintenance activities and costs related to the new recreational facilities, including any repairs needed over the life of these facilities. After construction is complete, the City of Westwego would charge entrance and use fees to partially fund operation and maintenance of the facilities.

3.3.7.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that it is constructed as designed and it enhances recreational use. The City of Westwego would be responsible for performance and use monitoring and for obtaining as-built designs from the alternative engineer. Monitoring would be designed around the alternative objective to enhance and increase outdoor enjoyment and recreational fishing opportunities by constructing a new water-based recreation facility. Funding for post-construction monitoring is not included in the alternative cost estimate and would be the responsibility of the City of Westwego. See Appendix C for the MAM plan for the alternative.

3.3.7.2 OIL POLLUTION ACT EVALUATION

3.3.7.2.1 Cost Effectiveness

The cost to implement the alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The proposed cost of the NRDA-funded portion of the alternative is \$995,000 (Table 3.3-4). The alternative has gone through a preliminary design process, and further E&D are needed for alternative implementation. The land acquisition cost of \$2,500,000 was borne by the City of Westwego for the purpose of constructing the alternative, and the city is providing clearing and preparation work at the site, including road improvements, to facilitate construction of the NRDA-funded alternative features. The city plans to charge entrance and use fees to cover long-term operation and maintenance of the facilities. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects.

The estimated cost for the alternative is \$995,000, which includes E&D, construction, materials, and utility services (see Table 3.3-4). This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative, nor for site preparation work, all of which are the responsibility of the City of Westwego.

Table 3.3-4. Construction Cost Estimate - WHARF Phase 1 Alternative

Description	Cost
Construction and materials	\$795,000
E&D, contingency, water and electric service	\$200,000
Total (NRDA funds)	\$995,000

All work would be awarded in compliance with Louisiana’s public bid laws and regulations, ensuring that the alternative is constructed at current market rates.

3.3.7.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed earlier in this RP/EA, most of the recreational use loss in Louisiana as a result of the spill was to recreational fishing. The recreational assessment, discussed in the Final PDARP/PEIS, also focuses on loss of shoreline use and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational fishing experiences both by increasing access and enhancing the quality of future recreational visits to the area. For this reason, the alternative’s goal of creating and enhancing visitor access to recreational fishing has the added benefit of providing both boat- and shoreline-based recreational activities including kayaking, wildlife viewing, hiking, biking, and fishing. Therefore, the alternative has a strong nexus to the public’s lost recreational fishing and access to shoreline uses. The recreational opportunities that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to the boat launch and shoreline area are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative’s location and amenities are within the geographical footprint of the DWH recreational injury. The alternative’s boardwalk, fishing piers, and restroom facilities elements are designed to be used by boat- and shoreline-based recreational anglers and wildlife viewers. The elements would aid and enhance the users’ abilities to access and interact with natural resources in the Bayou Segnette area, including Bayou Segnette State Park.
- **Scope of benefits:** The scope of benefits for the alternative’s fishing piers and boardwalk would be a direct function of capacity use at the newly developed alternative. All facilities would be constructed to meet the accessibility standards required by the ADA, thereby making the new recreational facilities open to all members of the public. These alternative elements would be measured as part of the alternative’s monitoring plan.

- **Public access:** The recreational benefits of the alternative would be broadly available to the public using multiple modes of transportation. The alternative would be accessed using the four-lane Lapalco Boulevard. There is a public bus stop immediately adjacent to the entrance to the alternative, using Jefferson Parish Transit Route W3 Lapalco (Jefferson Transit 2018). In addition, there are several residential neighborhoods within a reasonable 1-mile walking or biking distance from the alternative. No users would be actively excluded by the alternative, although an entrance fee would be charged to support the maintenance of the alternative. During the peak summer season, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative's infrastructure would create new recreational opportunities in the City of Westwego. In its current unmaintained condition, the site already experiences some recreational fishing. This implies a high marginal value for the alternative. The alternative is located within the New Orleans metropolitan area and would be available to a large potential visitor and recreational fishing population.

3.3.7.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and enjoyment of shoreline uses has a high likelihood of success. Land acquisition is complete, and the City of Westwego has begun site preparation work and road improvements.

3.3.7.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The proposed facilities would be constructed adjacent to the Dugues Canal which connects to Bayou Segnette and would require both excavation and grading as well as in-water work for placement of the fishing piers and boardwalk. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.7.

3.3.7.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational fishing. Additional benefits of the alternative include overall enhanced recreational experiences and access to shoreline uses, including kayaking, hiking, and wildlife viewing.

3.3.7.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by cleaning up the abandoned airport and revitalizing the site with recreation infrastructure. The existing site is subject to vandalism and trash dumping. It offers potential for a water-based recreation area; however, it needs clean up and redevelopment support. Although currently used by some members of the public for fishing, the site does not offer a safe environment for recreation. Lighting, parking areas, and safe water access are needed for proper recreation activities. These public health and safety issues associated with the existing site would be addressed by the alternative, improving the overall public health and safety of the area.

3.3.7.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new and improved public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.8 Bayou Segnette State Park Improvements

3.3.8.1 ALTERNATIVE DESCRIPTION

The Bayou Segnette State Park Improvements alternative was submitted by the Louisiana Office of State Parks. The alternative would involve three elements: 1) upgrades to an existing boating area to address soil subsidence issues affecting recreational opportunity; 2) upgrades to a playground to comply with ADA requirements; and 3) repairs to road and parking areas damaged by repeated flooding from storms and soil subsidence. The alternative would address issues caused by soil subsidence and flooding and compliment ADA compliance efforts made at other locations within the park, which would improve the recreational use of the state park.

The alternative is located in Jefferson Parish southwest of New Orleans and the Mississippi River in the City of Westwego (Figure 3.3-8). The alternative is located entirely within the Bayou Segnette State Park. The alternative address is 7777 Westbank Expressway, Westwego, Louisiana 70094.



Figure 3.3-8. Location of the Bayou Segnette State Park Improvements alternative.

3.3.8.1.1 Current and Historical Recreational Use

The State of Louisiana acquired the 676-acre the Bayou Segnette State Park in 1980. Phase 1 construction for the park was completed in 1984, and this portion of the park opened in 1985. Phase 2 construction was completed, and this portion of the park opened in 1987. Recreational opportunities within the park include campsites, cabins, comfort stations with showers and laundry, RV dump stations, a group camp with kitchen and dormitories, a meeting room, a wave pool, a swimming pool, nature trails, bird watching, fishing, and a boat launch with access to the marshlands and waterways of the bayou.

The entire park has been significantly affected by soil subsidence (land sinking) that has resulted in safety issues in many areas, threatening the recreational use of the park. The boating areas of the park include two areas divided by a flood protection levee: one area that includes parking, access roads, and restroom is located on the protected side of the levee; the other area that includes the boat launches, docks, floating pier, and access drive is located on the unprotected side of the levee. Soil subsidence has reduced the drainage of the parking area which now floods during high tide and has caused and continues to cause the boat launch area to sink further. These issues need to be addressed to keep the boating area functional. In addition, soil subsidence has caused road elevation problems at bridges throughout the park because the pile-supported bridges subside at a different rate than the surrounding roads. This poses a threat to the safety and accessibility of the park.

The boat launch area provides six double-lane boat launches and five boat docks located between the double lanes. Approximately 10 boats can be moored at any one time. The boat trailer parking has a capacity of approximately 175 vehicles with trailers, with an additional 40 sites available in an overflow parking area. The alternative would not alter these features or change the capacity of the boating area.

Over the life of the park, most of the park has not been ADA compliant; however, recent infrastructure upgrades for ADA compliance have aided in improving the recreational experience for those users who require specialized access infrastructure. Currently, the playground areas are not ADA compliant, which limits use of this area for certain users.

3.3.8.1.2 Enhanced Recreational Use

The Louisiana Office of State Parks is pursuing the alternative to repair the existing boating area and re-pave most roads and parking lots throughout the park to address damage caused by repeated flooding and soil subsidence issues within the Bayou Segnette State Park and to improve recreational access and safety in these areas, as well as upgrading the existing playground to improve ADA access. The alternative would achieve these goals by: 1) re-paving approximately 4.52 miles (649,032 square feet) of roads and 445,471 square feet of parking lots to raise the surface elevation by 2 to 6 inches; and 2) replacing the existing non-ADA-compliant playground with ADA-compliant surfacing, play structures, and access. The new playground area would be targeted to 5- to 12-year olds and would have 18 to 22 play features with divided ground and above-ground levels. Each of these alternative elements would help achieve the alternative goals and would likely increase park visitation and enjoyment of multiple recreational activities.

Repairing the existing roads and parking lots within the Bayou Segnette State Park, including the boating area, would include the following:

- Approximately 0.435 mile of existing two-way circulation road, with 12-foot-wide lanes, and 107,682 square feet of parking in the boating area
- Approximately 0.17 mile of existing two-way launch area road, with 12-foot-wide lanes, and 43,976 square feet of overflow parking in the boating area
- Approximately 1.4 miles of existing four-lane divided main entry boulevard
- Approximately 2.51 miles of existing roads throughout the park, consisting of the Day Use Loop road, group camp access road, and main cabin and campground access road
- Approximately 293,813 square feet of existing parking areas (wave pool parking lot, southern campground road and paved camping areas)

Upgrading the existing playground area within the Bayou Segnette State Park would include the following:

- Removal of existing playground structures, fall surfacing, and barriers within the playground area
- Construction of new concrete slab foundation with ADA-compliant fall surfacing in the existing playground area
- Construction of new playground equipment

3.3.8.1.3 Construction Methodology and Schedule

The alternative would take approximately 18 to 44 months from start to finish, depending on whether the alternative elements would be constructed in unison or sequenced, subject to approval of permits and environmental review. A conceptual design has already been developed. Preliminary planning, commencement activities, and E&D are anticipated to take from 4 to 6 months for each alternative element. Construction, including contracting and pre-construction activities, is anticipated to take from 6 to 12 months for each alternative element. The construction methodology for each of the alternative elements are described below.

The pavement repair would include the circulation road, main parking lot, overflow parking lot, and the boat launch area. The circulation road and main parking lot would consist of approximately 0.435 mile of road and 138,500 square feet of parking lot and reviving an asphalt overlay to provide at least a 2-inch lift in pavement elevation. The boat launch areas and overflow parking lot would consist of an asphalt overlay that would provide at least a 6-inch lift in pavement elevation for 0.17 mile of roadway and 43,976 square feet of parking lot area. Other select areas throughout the park would receive a 2-inch minimum lift asphalt overlay: the approximately 1.4-mile-long four-lane divided main entry boulevard, the approximately 1.54-mile-long two-way Day Use Loop road, approximately 0.3-mile-long two-way group camp access road, approximately 0.67-mile-long main cabin and campground access road, a 139,425-square-foot parking lot at the wave pool, and a 154,388-square-foot road and parking area at the southern campground. There are three wooden bridges along the Day Use Loop road that would likely require placement of asphalt wedges (asphalt laid thicker on one end to create a ramp) on both sides of the bridges and replacement of steel hinged transition plates. These road repairs would include minor repairs to the road base where necessary prior to asphalt overlay. The travel lanes for all roads have a footprint of 12 feet wide (typically 14 feet on turns).

The overall road length to be re-paved would be approximately 4.52 miles with an area of approximately 649,032 square feet. The overall parking area to be re-paved would be approximately 476,289 square feet. The road and parking lot overlay would raise the elevation of these elements to improve drainage off the travel surfaces. This would improve longevity of the roads and increase safe driving conditions. Some additional minor transition work adjacent to roads and parking lots may be necessary and could include pedestrian routes, sidewalks, light poles, curbs, and signs. Painting of travel lanes would be limited to roadways and parking lots. In-water work would be limited to paving in the boat launch areas that lie below high tide, which would be approximately 2,500 square feet of the road area in the boating area. No piling work is expected at the docks associated with the boat launches.

The construction associated with the removal and replacement of the playground equipment and fall surfacing would be limited to the existing playground area located to the north of the day use area. This work would include the removal of existing play structures, fall surfacing with a containment barrier, and construction of a new foundation (likely concrete slab) with ADA-compliant fall surfacing (such as No-Fault), new playground structures, and connection to the existing ADA-accessible walkway. Some terrestrial piling work may be conducted at the playground area associated with these improvements. The existing concrete walkway was recently constructed for ADA compliance and would be protected.

3.3.8.1.4 Maintenance Requirements

The Louisiana Office of State Parks would be responsible for all maintenance activities and costs related to the new and improved structures, which would include the improved playground areas, and the existing repaired boating area and road infrastructure, as well as any ongoing maintenance and repairs needed over the life of these features. After construction of the alternative elements were completed, operators currently servicing the park and fees associated with the park, including camping, pool, and rental fees, would not be expected to change from the current system.

3.3.8.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that all alternative elements are constructed as designed, and that the alternative enhances recreational use compared with pre-alternative conditions. The Louisiana Office of State Parks would be responsible for performance and use monitoring and for obtaining as-built designs from the engineer of the alternative. Funding for post-construction monitoring is not included in the alternative cost estimate, and would be provided by the Louisiana Office of State Parks. See Appendix C for the MAM plan for the alternative.

3.3.8.2 OIL POLLUTION ACT EVALUATION

3.3.8.2.1 Cost Effectiveness

The cost to implement the proposed Bayou Segnette State Park Improvements alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The proposed cost of the alternative is \$2,126,724 (Table 3.3-5). The alternative has gone through a preliminary design process, and further E&D are needed for alternative implementation. The alternative would be implemented entirely within an existing state park with existing camping and use fees to fund the operation and maintenance of the park. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects.

The estimated cost for the alternative is \$2,126,724, which includes E&D (including pre-construction testing and surveys), construction, and materials for each of the alternative elements (see Table 3.3-5). This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

Table 3.3-5. Construction Cost Estimate - Bayou Segnette State Park Improvements Alternative

Description	Cost
Boating Area Repairs Subtotal	\$437,465
Construction and materials	\$349,972
E&D	\$87,493
Playground Upgrades Subtotal	\$210,000
Construction and materials	\$168,000
E&D	\$42,000
Road and Parking Repairs Subtotal	\$1,479,259
Construction and materials	\$1,183,407
E&D	\$295,852
Total (NRDA funds)	\$2,126,724

All work would be awarded in compliance with Louisiana's public bid laws and regulations, ensuring that the alternative is constructed at current market rates. Projections of operating costs and use were based on other similar projects managed by the Louisiana Office of State Parks.

3.3.8.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. Louisiana Trustees have identified lost recreational fishing opportunities as the most significant impact to recreational use in the state. In addition, the recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance access to recreational fishing, boating, and camping opportunities both by increasing visitation and enhancing the quality of future recreational visits to the area. For this reason, the alternative's goal of addressing issues caused by soil subsidence and flooding and improving ADA compliance and overall safety of the park would enhance and preserve public access to recreational fishing and would also expand the public use of the playground area to those in need of ADA-compliant access infrastructure. Therefore, the alternative has a strong nexus to the public's lost recreational fishing and access to shoreline uses. The recreational opportunities that would be improved by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to the park, including its boat launch and shoreline areas, are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location and amenities are within the geographical footprint of the DWH recreational injury. The alternative's improvements to the parking and boat launch elements are designed to be used by boat- and shoreline-based recreational anglers and to enhance and protect their ability to access and interact with natural resources in the greater New Orleans area. Additionally, ADA access and expansion of public use from playground improvements would provide multi-generational benefits beyond fishing access and shoreline uses to include the younger members of families seeking shoreline and fishing recreation.
- **Scope of benefits:** The scope of benefits for the alternative's improvements to the parking and boat launch areas would be a direct function of future use at the boat launch and associated park features and would be measured as part of the alternative's monitoring plan. The capacity of the boating area is not expected to change as a result of the alternative.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. In addition, because of the close proximity to New Orleans, public transit is available to the state park, allowing the alternative to benefit individuals that live within the New Orleans Regional Transit Authority (NORTA) and Jefferson Parish Transit service areas and individuals who own vehicles. Therefore, most potential users would have access to the benefits proposed by the alternative. During the peak summer season, park capacity and crowding would limit the total benefits available.

- **Location:** The alternative's improvements would enhance existing park infrastructure that has been damaged by issues caused by soil subsidence to improve access to the boat launch and the existing recreational opportunities that it provides the public. The alternative would preserve current public use of this infrastructure into the future and attract new users to the park, which implies a moderate marginal value for the alternative. The alternative is just outside of a major urban community (New Orleans, Louisiana, and surrounding communities); is less than a 0.5-hour drive from New Orleans, Louisiana; and would be available to a large potential visitor and recreational fishing population

3.3.8.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and enjoyment of shoreline uses has a high likelihood of success. No land acquisition is required, and the Louisiana Office of State Parks has successfully implemented similar improvement projects at other state parks as part of its day-to-day park management responsibilities. The road and parking lot repairs would raise the elevation of the elements, thereby improving drainage off travel surfaces. This would improve the longevity of the roads and increase safe driving conditions. The existing Bayou Segnette State Park has been operational since 1987 and provides access to natural resources to a large population. The ongoing maintenance and management of the park would not change, and in fact may become more cost-efficient, as a result of the alternative.

3.3.8.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The proposed improvements would occur within an existing state park and would not require any disturbances to areas outside of the existing infrastructure footprint. The re-paving of the boat launch and associated facilities would potentially require some minor in-water work. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.8.

3.3.8.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to preserve and enhance recreational fishing but would also provide enhanced access to people in need of ADA-compliant access infrastructure and preserve shoreline access and wildlife viewing. The addition of roads and parking areas would result in improved access and capacity for recreational users, and playground facilities would encourage enhanced use for families seeking fishing and shoreline recreation by providing additional spaces for younger children.

3.3.8.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by improving the safety of roads and parking areas within the park and addressing flooding issues in the boating area. These roads and parking areas have been damaged by continual flooding and soil subsidence that has compromised the safety of the boating area. Additionally, the ADA-compliant improvements to the playground area would benefit public health safety due to improved fall surfaces and play structures.

3.3.8.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would preserve and improved public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.9 Atchafalaya Delta Wildlife Management Area Access

3.3.9.1 ALTERNATIVE DESCRIPTION

The Atchafalaya Delta WMA Access alternative, submitted by LDWF, would involve dredging two site-specific areas in order to enhance recreational access for hunters, anglers, and wildlife viewers. The alternative would enhance the ability for boaters and hunters to access the Breaux Pass, Cul-de-sac Pass, and many interior waterways and wetlands of the Atchafalaya Delta WMA. Within the Atchafalaya Bay, two deltas (the Main Delta and the Wax Lake Delta) have formed from the accretion of sediments from the Atchafalaya River and from the deposition of dredged material by USACE. The alternative would be located on the Main Delta of the Atchafalaya River and would restore hydrology to two shoaled passes. Dredged sediment resulting from the alternative would be used beneficially to enrich and nourish wetlands. Dredged sediments would be placed at an elevation to provide nesting habitat for mottled ducks and a variety of secretive marsh birds. The alternative would also create terrestrial habitat for a number of wildlife on Atchafalaya Delta WMA.

3.3.9.1.1 Current and Historical Recreational Use

The Atchafalaya Delta WMA is a 137,695-acre area located at the mouths of the Atchafalaya River and the Wax Lake Outlet in St. Mary Parish (Figure 3.3-9). The WMA is owned and managed by State of Louisiana. The WMA is located approximately 25 miles south of Calumet, Louisiana, and is accessible only by boat. Most of the area consists of open water in Atchafalaya Bay. The Atchafalaya Delta WMA is highly used for recreational hunting and fishing and hosts approximately 25,000 visitors annually (LDWF 2016).



Figure 3.3-9. Location of the Atchafalaya Delta Wildlife Management Area Access alternative.

3.3.9.1.2 Enhanced Recreational Use

LDWF is proposing to dredge Breaux Pass and Cul-de-sac Pass in order to enhance access for hunters, anglers, and wildlife viewers to the interior marsh. A floating bucket dredge would be used to excavate each pass, as follows:

- Dredging in Breaux Pass would include excavation of approximately 25,000 cubic yards of material (2,000 feet long, 80 feet wide, and 10 feet deep). Dredge materials from Breaux Pass would be placed along the south bank of the pass (see Figure 3.3-9). The dredging and placement area footprints for Breaux Pass would not exceed approximately 15 acres of open/in-water areas.
- Dredging in Cul-de-sac Pass would include excavation of approximately 31,000 cubic yards of material (4,000 feet long, 50 feet wide, and 10 feet deep). Dredge spoils from Cul-de-sac Pass would be placed in alternate deposits along both banks of the pass (see Figure 3.3-9). The dredging and dredge spoil footprints for Cul-de-sac Pass would not exceed approximately 8 acres of open/in-water areas.

Dredging at Breaux and Cul-de-sac Passes would result in deeper and wider passes than currently exist, allowing boats deeper draft space, which also would accommodate a greater diversity of boat types and sizes. Preliminary plans are shown in Appendix E, Figure E-8.

3.3.9.1.3 Construction Methodology and Schedule

In-water work is expected exclusively because the construction for the access improvements would take place within the active channels of Breaux and Cul-de-sac Passes. The dredging and dredge spoil footprints for both passes would not exceed approximately 23 acres of substrate displacement in open/in-water areas.

Construction equipment for the access improvements would include a floating bucket. Staging would take place on a floating barge.

The construction start date and duration would be determined by LDWF during final design.

3.3.9.1.4 Maintenance Requirements

LDWF would be responsible for all maintenance activities and costs related to the improved Breaux and Cul-de-sac Passes, including any repairs needed over the life of the passes.

3.3.9.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that it is constructed as designed, and that it enhances recreational use compared with pre-alternative conditions. LDWF would be responsible for performance and use monitoring and for obtaining as-built designs from the engineer of the alternative. Funding for post-construction monitoring is not included in the alternative's cost estimate. Post-construction monitoring would be provided by LDWF. See Appendix C for the MAM plan for the alternative.

3.3.9.2 OIL POLLUTION ACT EVALUATION

3.3.9.2.1 Cost Effectiveness

The cost to implement the alternative is reasonable, appropriate, and comparable to other equivalent improvement alternatives. The proposed cost of the NRDA-funded portion of the total estimated alternative cost is \$920,450. The alternative has gone through a preliminary design process, but further

E&D are needed for alternative implementation. There was no land acquisition cost associated with the alternative. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects.

The estimated cost for the alternative includes E&D, geotechnical work, construction, and materials. Operation, maintenance, or monitoring of the alternative is already included in LDWF's regular Atchafalaya Delta WMA mission and annual operating budget.

All work would be awarded in compliance with Louisiana's public bid laws and regulations, ensuring that the alternative is constructed at current market rates. Projections of operating costs and use were based on other similar projects managed by LDWF.

3.3.9.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. Louisiana Trustees have identified lost recreational fishing opportunities as the most significant impact to recreational use in the state. In addition, the Final PDARP/PEIS, focuses on loss of shoreline use and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational experiences by improving access to two site-specific areas: Breaux Pass and Cul-de-sac Pass. For this reason, the alternative's goal of creating and enhancing visitor access to the interior marsh has the added benefit of providing both boat- and shoreline-based recreational activities and fishing. Therefore, the alternative has a strong nexus to the public's lost recreational uses. The recreational opportunities that would be created by the alternative are the same shoreline and boating uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing and hunting, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to Breaux and Cul-de-sac Passes are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location is within the geographical footprint of the DWH recreational injury. The alternative's access improvements are designed to be used primarily by boaters, but may also service shoreline-based recreational users, such as hunters and wildlife viewers, who disembark from their boat to recreate from shoreline areas of the interior marsh. The access improvements would aid and enhance recreational user's ability to access and interact with natural resources in the interior marsh of the Atchafalaya Delta WMA.
- **Scope of benefits:** The scope of benefits for the alternative's access improvements would be a direct function of capacity use at Breaux and Cul-de-sac Passes and would be measured as part of the monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. However, because of the extremely remote nature of the area, benefits would likely accrue primarily to individuals who own boats and the vehicles to transport them, both of which require sufficient disposable income. No users would be actively excluded by the alternative. Even during the peak fall season, capacity and crowding would not be anticipated to limit the total benefits available.

- **Location:** The alternative would improve access to an area where recreational fishing and hunting are popular activities. This implies a moderate marginal value for the alternative. The alternative is close to multiple communities (including Patterson, Amelia, Morgan City, Lafayette, Houma, and Baton Rouge, Louisiana); is an approximately 2-hour drive and 1-hour boat ride from New Orleans, Louisiana; and would be available to a large potential visitor and recreational fishing population.

3.3.9.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and hunting access has a high likelihood of success. No land acquisition is required, and LDWF has successfully implemented similar recreational access projects in similar settings as part of its day-to-day natural resource management responsibilities. LDWF already has the capacity to maintain and operate the alternative.

3.3.9.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The two access improvements at Breaux Pass and Cul-de-sac Pass would be constructed within existing passes within the Atchafalaya Delta and would require dredging. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.9.

3.3.9.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance access for recreational fishing and hunting but also to provide enhanced interior marsh access for wildlife viewing. A secondary benefit of the alternative is the enhanced sediment transport that dredging the passes would facilitate. The dredged sediment would be placed on bank lines adjacent to the crevasses to an elevation to support nesting waterfowl and secretive marsh birds. This placed sediment would also strengthen the bank line and reduce erosion into the crevasses, thus maintaining the function of the crevasses. Additionally, the crevasses themselves would divert sediment-laden water into nearby shallow ponds and bays and enrich wetlands for at least 10 years.

3.3.9.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by improving the ability to safely access the interior marsh from Breaux and Cul-de-sac Passes. The existing access at these passes is very difficult to navigate and needs improvement. The existing access is dependent upon water levels and sediment load. Current conditions often present safety hazards for boating ingress and egress activities that would be anticipated to be eliminated if the passes are dredged as proposed.

3.3.9.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new and improved public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.10 Atchafalaya Delta Wildlife Management Area Campgrounds

3.3.10.1 ALTERNATIVE DESCRIPTION

The Atchafalaya Delta WMA Campgrounds alternative, submitted by LDWF, would improve the existing Wax Lake Outlet Campground to provide an enhanced recreational setting and opportunities for hunters, anglers, wildlife viewers, and campers. The alternative would enhance the recreation setting and opportunity for boaters and hunters to camp by offering a safe, protected campsite that is accessible by boaters. LDWF proposes to install a bulkhead along the campground approximately 30 feet from the existing shoreline on the east side of the campground. Local sediment would be placed behind the bulkhead on the east end to restore some of the lost acreage of the campground. Additionally, construction of jetties would keep the bank and bulkhead stabilized (Figure 3.3-10). Currently, the approximately 1,200-foot-long shoreline at the campground has eroded away, making docking and mooring difficult and dangerous. After the bulkhead is complete, two additional 40-foot docks would be installed adjacent to portions of the bulkhead. The alternative would be located on the Wax Lake Delta of the Atchafalaya River within the Atchafalaya Bay.

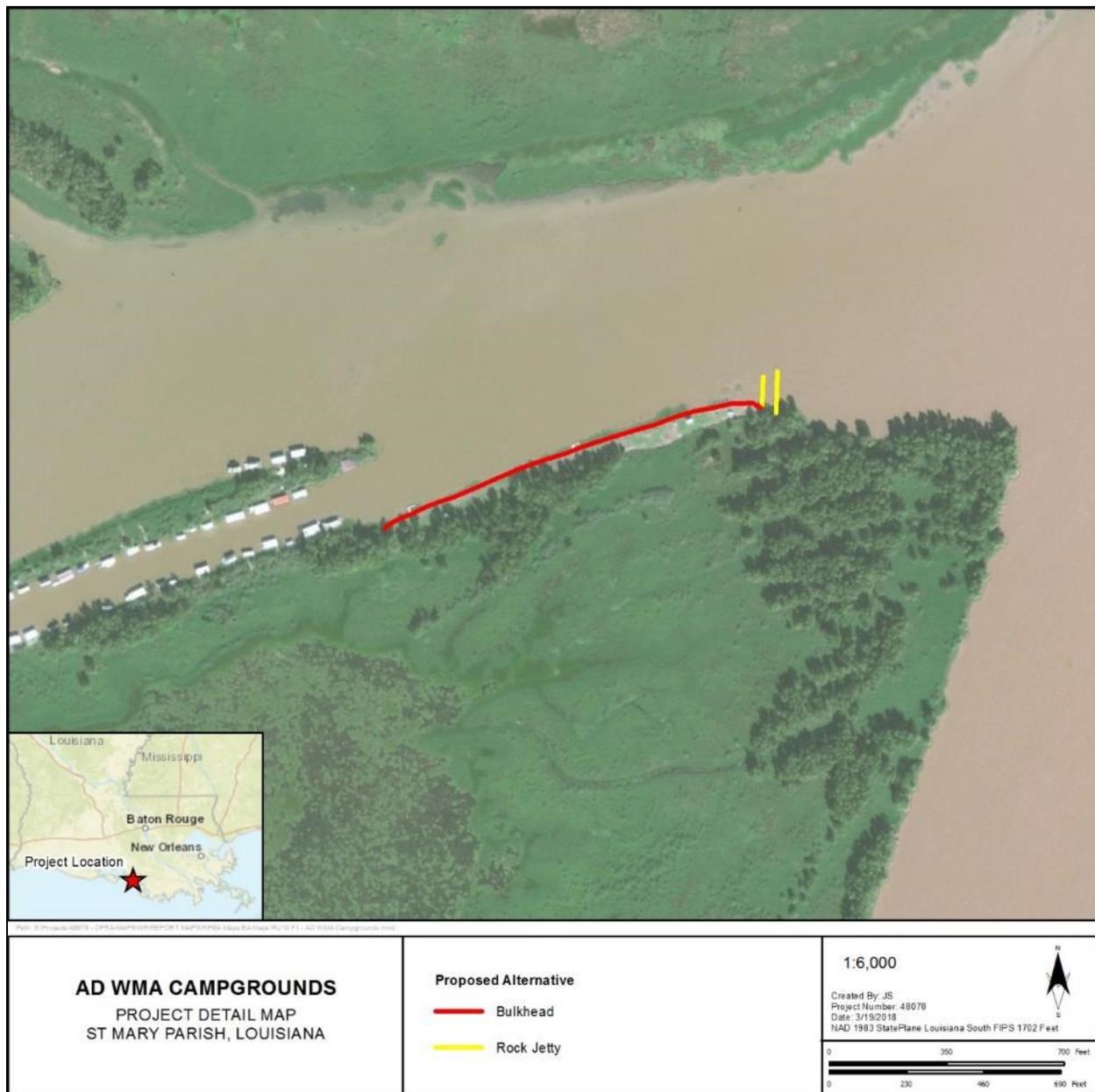


Figure 3.3-10. Location of the Atchafalaya Delta Wildlife Management Area Campgrounds alternative.

3.3.10.1.1 Current and Historical Recreational Use

The alternative is located within Atchafalaya Delta WMA, an 137,695-acre area located at the mouths of the Atchafalaya River and the Wax Lake Outlet in St. Mary Parish (see Figure 3.3-10). The WMA is owned and managed by State of Louisiana. The WMA is located approximately 25 miles south of Calumet, Louisiana, and is accessible only by boat. Most of the area consists of open water in Atchafalaya Bay. The Atchafalaya Delta WMA is highly used for recreational hunting and fishing and hosts approximately 25,000 visitors annually (LDWF 2016).

3.3.10.1.2 Enhanced Recreational Use

LDWF is proposing to install two jetties and a bulkhead at the campground (see Figure 3.3-10). Preliminary plans are shown in Appendix E, Figure E-9. The two jetties would be located at the far east end of the campground where water flow is the strongest (southerly flow from Wax Lake toward the Gulf of Mexico). The jetties would function as a breakwater and the material used for the jetties defends the riverbank and the bulkhead by training the active channel away from the campground. One jetty (west) would be 85 feet in length and the other jetty (east) would be 120 feet long. The jetties would be parallel, and approximately 50 feet apart from each other. Materials used for the jetties would be determined during final design by the engineer, but would likely either be rock, soils, and gravel or timbers and vinyl, from approved sources.

The bulkhead would be installed to follow the contour of the shoreline following the entire length of the campground (approximately be 1,200 linear feet). The east end of the bulkhead would be installed approximately 30 feet from the shoreline, and backfilling with local sediment would be needed behind the new bulkhead to restore the footprint of the campground. The bulkhead is designed so that boats may dock or moor to the bulkhead or two new 40-foot docks, offering direct and safe access to the campground. The jetties and bulkhead would provide stronger, safer streambanks at the campground that would be less susceptible to existing and future erosion.

3.3.10.1.3 Construction Methodology and Schedule

In-water work and upland work are expected because the construction for the jetties and bulkhead would take place both within the water and along the immediate shoreline. A floating bucket dredge would be used to excavate, place, and compact material. Minor upland activity may include hand digging and loading. Typical construction equipment used for this type of project includes a crane, boom, set of leads, pile hammer, helmet, pile gate, and pile monkey. Some associated equipment can be staged either onshore at the campground or on a barge in the waterway.

Some backfilling with local sediment would be needed behind the new bulkhead. Backfill would use local materials (e.g., sedimentation build-up) and would not create new materials pits or holes. The bulkhead would be installed with a crane and impact hammer pile, but would also require hand crews on the upland (i.e., the campground) portions of the alternative.

The construction start date and duration would be determined by LDWF during final design, but would not take place between November and January.

3.3.10.1.4 Maintenance Requirements

LDWF would be responsible for all maintenance activities and costs related to the improved Wax Lake Outlet Campground, including any repairs needed over the life of the jetties and bulkhead.

3.3.10.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that it is constructed as designed, and that it enhances recreational use compared with pre-alternative conditions. LDWF would be responsible for performance and use monitoring and for obtaining as-built designs from the alternative engineer. Funding for post-construction monitoring is not included in the alternative cost estimate. Post-construction monitoring would be provided by LDWF up to 1 year. See Appendix C for the MAM plan for the alternative.

3.3.10.2 OIL POLLUTION ACT EVALUATION

3.3.10.2.1 Cost Effectiveness

The cost to implement the alternative is reasonable, appropriate, and comparable to other equivalent improvement alternatives. The proposed cost of the NRDA-funded portion of the total estimated alternative cost is \$3,248,000. The alternative has gone through a preliminary design process, and further E&D are needed for alternative implementation. There was no land acquisition cost associated with the alternative. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar LDWF projects.

The estimated cost for the alternative includes E&D, geotechnical work, construction, and materials. Operation, maintenance, or monitoring of the alternative is already included in LDWF regular Atchafalaya Delta WMA mission and annual operating budget.

All work would be awarded in compliance with Louisiana's public bid laws and regulations, ensuring that the alternative is constructed at current market rates. Projections of operating costs and use were based on other similar projects managed by LDWF.

3.3.10.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. Louisiana Trustees have identified lost recreational fishing opportunities as the most significant impact to recreational use in the state. In addition, the recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas (such as the campground). These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance camping and docking facilities for recreational hunters and anglers by improving conditions at the existing campground. For this reason, the alternative's goal of enhancing visitor experiences for to recreational camping, fishing and hunting has the added benefit of providing both boat- and shoreline-based recreational activities. The campground serves both shoreline use and boating. Therefore, the alternative has a strong nexus to the public's lost recreational shoreline and boating uses. The recreational opportunities that would be created by the alternative are the same shoreline and boating uses that were lost or diminished as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to the campground are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location is within the geographical footprint of the DWH recreational injury. The alternative's camping and docking enhancements are designed to be used primarily by shoreline-based recreational users, but may also serve boaters who used the campground as a "base camp" while boating to various day-trip destinations in the surrounding WMA. The campground improvements would enhance the recreational setting and opportunities of the Atchafalaya Delta WMA.
- **Scope of benefits:** The scope of benefits for the alternative's campground enhancements would be a direct function of recreational use and would be measured as part of the alternative's monitoring plan.

- **Public access:** The recreational benefits of the alternative would be broadly available to the public. However, because of extremely remote nature of the campground, benefits would likely accrue primarily to individuals who own boats and the vehicles to transport them, both of which require sufficient disposable income. No users would be actively excluded by the alternative. During the peak fall season, capacity and crowding at the campground would not be anticipated to limit the total benefits available for up to 2 weeks of the year.
- **Location:** The alternative would improve the campground setting, enhancing the recreational opportunities in the campground. This implies a high marginal value for the alternative. The alternative is close to multiple communities (including Patterson, Amelia, and Morgan City, Louisiana); is an approximately 2.5-hour drive and 1-hour boat ride from New Orleans, Houma, Baton Rouge, and Lafayette, Louisiana; and would be available to a large potential visitor and recreational population.

3.3.10.2.3 Likelihood of Success

The alternative's goal of providing a campground for the public has a high likelihood of success. No land acquisition is required, and LDWF has successfully implemented campground construction projects as part of its day-to-day natural resource management responsibilities. LDWF already has the capacity to develop, maintain, and operate the alternative.

The alternative would also offset the average shoreline erosion rate of 3 feet per year. This erosion is diminishing recreational opportunities because it eliminates property available to camp on. Installation of the jetties and bulkhead would restore and preserve land for camping and offset future land loss.

3.3.10.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The proposed campground enhancements would be constructed at a site that is already used for camping. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.10.

3.3.10.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to enhance camping and docking facilities for recreational fishing and hunting. Campground users may also pursue other recreational experiences such as wildlife viewing, hiking, and kayaking.

3.3.10.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by providing safer campground facilities within the WMA. Currently, the shoreline is eroding away, and the shoreline does not include safety measures such as jetties and/or a bulkhead, rendering the site unsafe to dock/moor in order to camp on the adjacent upland campground. The alternative would alleviate these safety concerns.

3.3.10.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide enhancements to an existing campground to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.11 Rockefeller Piers and Rockefeller Signage

3.3.11.1 ALTERNATIVE DESCRIPTION

The Rockefeller Piers and Rockefeller Signage alternative was submitted by LDWF. The alternative would include recreation enhancements within the Rockefeller Wildlife Refuge (RWR or Refuge), including new fishing piers and signage. The construction of new observation and fishing piers in Unit 4 within the Refuge would be for the continued benefit for public use and recreation. The proposed signage throughout the Refuge would inform the public of management considerations and use. Collectively referred to as the alternative, the development of the piers and signage would provide the RWR additional opportunity to benefit management and public use of the Refuge's resources.

The RWR is within the southeastern portion of the Chenier Plain Region of southwestern Louisiana in Cameron and Vermilion Parishes. The RWR borders the Gulf of Mexico for 26.5 miles and extends inland toward the Grand Chenier ridge, a stranded beach ridge 6 miles from the Gulf. The alternative is fully located within the RWR (Figure 3.3-11). LDWF manages and operates the RWR.

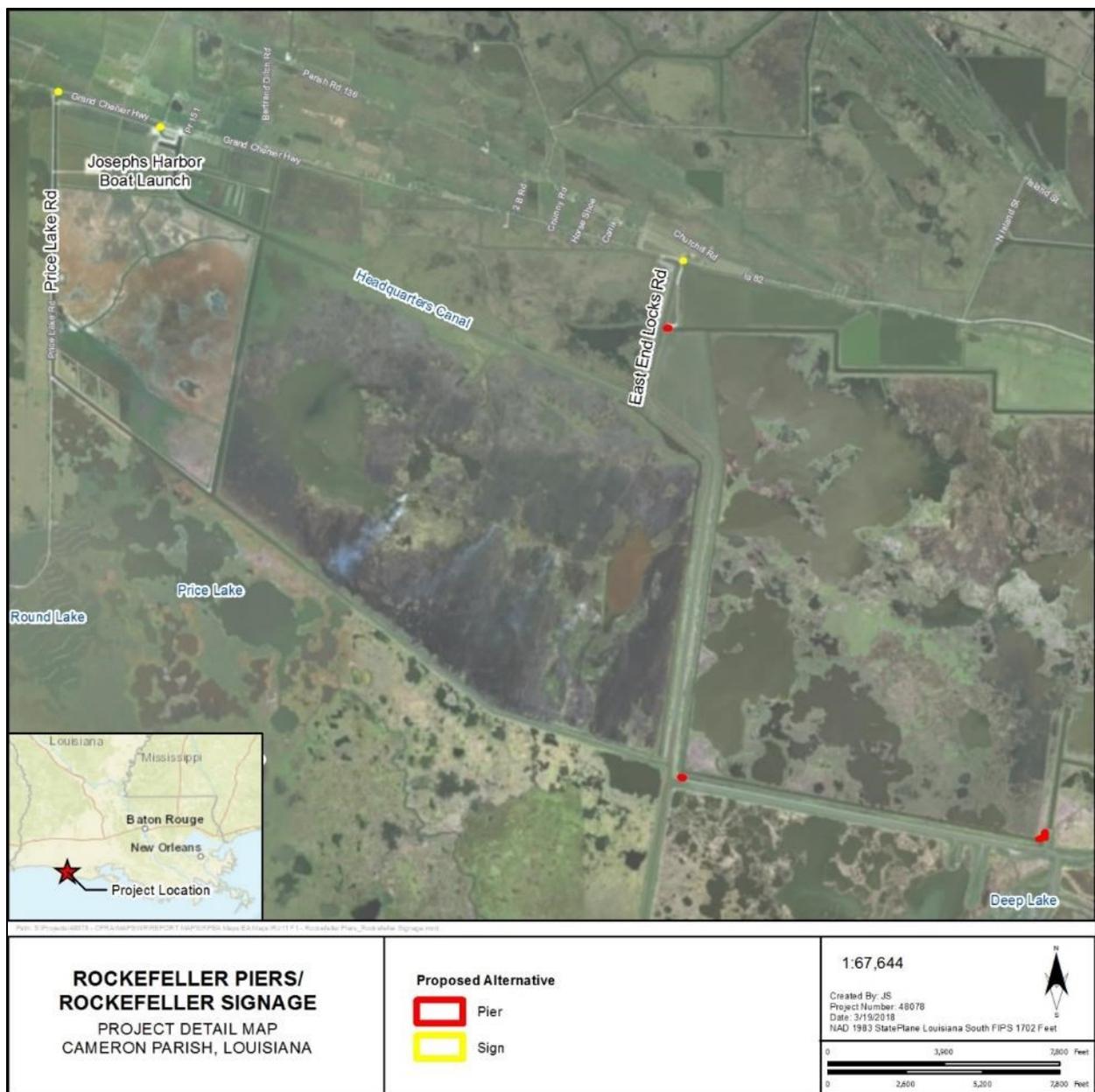


Figure 3.3-11. Location of the Rockefeller Piers and Rockefeller Signage alternative.

3.3.11.1.1 Current and Historical Recreational Use

The RWR was deeded to the state in 1920, and originally encompassed approximately 86,000 acres. The Refuge is one of the most biologically diverse wildlife areas in the nation.

The RWR has more than 200,000 public visitors annually. The RWR offers areas that are designated for public recreational use seasonally and year-round. Abundant fish, crab, and shrimp populations provide diverse recreational opportunities to anglers. Although the area is a refuge, visitors can fish from two roadside areas, as well as miles of canals from a boat. In addition to fishing, birdwatching is also popular. Hunting, commercial activities, and some non-consumptive uses (camping, riding, swimming) are not allowed within the RWR due to the Refuge's game preserve status and safety.

Public vehicle access to the RWR is via Louisiana Highway 82. Once on the RWR, the public can use approximately 6 miles of interior roads, the most popular access being Price Lake Road, located along the western boundary of RWR. In order to access most of the Refuge, there are three boat ramps that are open to public use. Two of these ramps are state owned, maintained by LDWF, and free to the public. These ramps, located by Joseph Harbor Canal just off Louisiana Highway 82 in Cameron Parish, are heavily used (LDWF 2014).

3.3.11.1.2 Enhanced Recreational Use

The LDWF would improve visitor use experience and enhance management with the following: three new piers and educational signage. The alternative would include construction of up to 560 feet of new piers at three locations within the Refuge. Past pier enhancements for recreational fishing and observation within the RWR have been successful and well received by the public. Since design and engineering are ongoing, location and details on the piers are limited. New piers would be of similar design to piers recently developed in the RWR.

The alternative also includes development of signage at the entrance of the Price Lake Road, East End Locks Road, Joseph Harbor Boat Launch, and along other roads and canals in the RWR. Proposed signage would provide location information, as well as education to the public on how the RWR works with other partners and parishes in order to reach common goals based around coastal conservation. Because coastal erosion is a particular concern within the RWR, proposed educational signage would also explain the steps being taken to protect the shoreline and create marsh in areas that need to be rehabilitated on the Refuge.

Signage would also provide information on how the public can help in the effort to preserve lands within the Refuge. Likewise, because the RWR's system of canals play such an important role in helping landowners to the north drain water after heavy rains or floods (drainage is an important characteristic of the Mermentau Basin), signage would provide another chance to educate the public on the importance the Refuge serves to many homes and businesses in areas of north Cameron and Vermillion Parish.

Currently, there are few signs on the Refuge marking the names of roadways, canals, or water-control structures. The RWR proposed installation of ultraviolet (UV)-resistant and sealed directional signs and location markers within these area, each branded to coordinate with LDWF guidelines for refuges and wildlife management areas. Areas proposed for signage include the following:

- The Price Lake Road currently brings visitors along a stretch of pristine marsh and provides visitors with the unique opportunity of fishing for shrimp and crabs without the need for a boat. Signage at the entrance of the Price Lake Road requires informational signs about activities allowed on the road, a history of the Refuge, and a map of where facilities are located (e.g., bird observatory, fishing piers, turnarounds, etc.). The placement of three large-panel informational signs, measuring 4 × 8 feet would be placed on an existing wooden frame that currently holds a number of highways signs.
- The East End Locks Road is on the on the eastern side of the Joseph's Harbor Canal and provides visitor access to new parking and fishing from recently replaced bulkheads. The road entrance at this site would have three panel signs on an existing wooden frame that is similar to the size, content, and branding of the signs on the Price Lake Road. Information at this location would pertain to management and information for this area.
- The Joseph Harbor Boat Launch is a free boat launch on the west side of the Joseph's Harbor Canal, with two launch spots lined with concrete bulkheads and large parking lot for trucks and trailers. The entrances at this site would have three panel signs on an existing wooden frame that is similar to the size, content, and branding of the signs on the Price Lake Road and East End Locks Road. Information at this location would pertain to management and information for this area.

- Various signs would be installed on other roadside access points from Louisiana Highway 82 delineating areas that are not publicly accessible or roads that are not public use. Currently these roads do not have signage. Small signs on either new wooden posts or u-channel galvanized posts would be installed within road rights-of-way.
- Various signs would be installed along 60 miles of canals within the RWR to aid boaters as to where they are located on the Refuge. Currently, there are no signs along any of the major canals (i.e., Joseph Harbor Canal, Superior Canal) or the intersection of various canals. Small signs on either new wooden posts or u-channel galvanized posts would be installed along canals.

3.3.11.1.3 Construction Methodology and Schedule

The proposed improvements are expected to take approximately 12 to 24 months from start to finish, subject to approval of permits and environmental review. Preliminary planning and E&D are anticipated to be completed in the first 6 months of the alternative.

Construction of the fishing piers would require in-water work and involve several phases of construction. Piles, typically made of treated wood, would be needed to support the piers and would be driven into the substrate along the proposed pier placements, with a set of two piles installed approximately every 15 feet. Each of these piles would be driven past the 15-foot engineering-set minimum depth into the substrate. These piles would be at least 40 feet long to allow for penetration, varying water depths, height of water, and rail height.

Construction methods for the pier extensions would be similar to that of the existing piers within the Refuge and include the use of marine-grade pressure-treated large timber members and stainless-steel fasteners. Pressure-treated wood products are manufactured and installed in a manner that minimizes any potential for adverse impacts to aquatic environments. Typical construction methods used to install, or drive, the piles would involve using an impact hammer pile (vibratory hammers are typically used on timber piles) with standard equipment (e.g., crane, boom, set of leads, pile hammer, helmet, pile gate, and pile monkey). The crane and associated equipment would be staged on a barge or on the shore. The pier would be approximately 6 feet wide. Barged heavy equipment would likely be needed for this construction

Signage at the Price Lake Road, East End Locks Road, Joseph Harbor Boat Launch locations would be on existing wooden structures and would not require new vegetation removal or excavation. Signage along other roads and canals described would require minimal vegetation removal and excavation (approximately 3-foot-diameter work area) to install the u-channel galvanized or wooden sign posts.

3.3.11.1.4 Maintenance Requirements

LDWF would be responsible for all activities and related costs of maintaining the piers and signage, including any repairs needed over the life of Refuge operation.

3.3.11.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that the proposed improvements are constructed as designed, and that they collectively enhance recreational use compared with current conditions. The LDWF would be responsible for performance and use monitoring and for obtaining as-built designs for development of the piers. See Appendix C for the MAM plan for the alternative.

3.3.11.2 OIL POLLUTION ACT EVALUATION

3.3.11.2.1 Cost Effectiveness

The cost to implement the alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. Proposed improvements have gone through a preliminary design process, and further E&D are needed for implementation. All improvements proposed are within lands managed by LDWF. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects.

The estimated NRDA-funded cost for the alternative is approximately \$690,000, which includes E&D, construction, and materials. This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

All work proposed would be awarded in compliance with Louisiana's public bid laws and other applicable regulations, ensuring that the improvements are constructed at current market rates. Projections of operating costs and use were based on other similar projects managed by LDWF.

3.3.11.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed earlier in this RP/EA, most of the recreational use loss in Louisiana as a result of the spill was to recreational fishing. The recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational fishing experiences both by increasing visitation and enhancing the quality of future recreational visits to the area. For this reason, the alternative's goal of creating and enhancing visitor access to recreational use (fishing) has the added benefit of providing both boat-based and shoreline-based recreational activities and fishing. Therefore, the alternative has a strong nexus to the public's lost recreational fishing and access to shoreline uses. The recreational opportunities that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to the boat launch and shoreline area are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location and amenities are within the geographical footprint of the DWH recreational injury. The alternative's observational piers and signage elements are designed to be used by boat- and shoreline-based recreational anglers and aid and enhance their ability to access and interact with natural resources in the RWR.
- **Scope of benefits:** The scope of benefits for the alternative's improvements would be a direct function of their capacity and would be measured as part of the alternative's monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. No users would be actively excluded by the alternative. During the peak summer season, parking capacity and crowding would limit the total benefits available.

- **Location:** The alternative's infrastructure improvements would replace and signage within high use areas within the RWR and where recreational activity is easily accessible and popular. This implies a high marginal value for the alternative.
- The alternative is close to multiple communities (including Grand Chenier and Lake Charles, Louisiana); and would be available to a large potential visitor and recreational fishing population

3.3.11.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and enjoyment of shoreline uses has a high likelihood of success. No land acquisition is required, and LDWF has successfully implemented similar recreational improvements as part of its day-to-day natural resource management responsibilities. LDWF already has the capacity to maintain and operate the alternative.

3.3.11.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The observation piers and signage enhancements would be constructed in areas throughout the RWR and would require both excavation and grading as well as potential or in-water work. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.11.

3.3.11.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational opportunities including fishing, shoreline access, hiking, and wildlife viewing.

3.3.11.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to improve and be beneficially impacted by improving visitor information and additional safe recreational access.

3.3.11.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new and improved public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.12 St. Bernard State Park Improvements

3.3.12.1 ALTERNATIVE DESCRIPTION

The St. Bernard State Park Improvements alternative was submitted by the Louisiana Office of State Parks. The alternative would involve the following elements to improve the recreational experience for visitors and campers: 1) renovate the entrance station to provide a better first impression of the park; 2) upgrade two restrooms and one bathhouse to improve appeal and sanitation; and 3) replace an existing swimming pool with a large pavilion to diversify potential recreational uses. The alternative would provide improved camping and day-use facilities for increased recreational use of the St. Bernard State Park benefiting public visitors' recreational experience.

The alternative is located in St. Bernard Parish approximately 11.5 miles southeast of New Orleans near the east bank of the Mississippi River (Figure 3.3-12). The alternative is located entirely within the St. Bernard State Park property, which is located south of Saint Bernard Parkway directly east of the unincorporated community of Caernarvon. The alternative address is 501 Saint Bernard Parkway, Braithwaite, Louisiana 70040.



Figure 3.3-12. Location of the St. Bernard State Park Improvements alternative.

3.3.12.1.1 Current and Historical Recreational Use

The State of Louisiana received the 358-acre site through a donation from a local family business in 1971 that became the St. Bernard State Park. The park operated for 34 years as the only state park in the St. Bernard/Plaquemines Parish area until, in 2005, it was closed for a year due to severe damage from Hurricane Katrina. It re-opened in December 2006, but remains one of the least-attended State Parks in Louisiana. Recreational opportunities within the park include campsites, picnic area with pavilion, multiple restrooms, swimming pool, and bathhouse.

Some upgrades have recently been made to the entrance station to improve aesthetics and to improve ADA compliance; however, other upgrades are needed to improve visitor appeal and increase use. Restrooms are an important element for retention of visitors at park facilities. Visitors are less likely to visit or stay at a park if restrooms appear unsanitary or if there are not enough restrooms to serve the public need. To address this issue, Louisiana Office of State Parks has identified one restroom and one bathhouse that need renovation and one restroom facility that needs replacement. These updates would also address ADA compliance for these facilities. Additionally, recreational use of the old swimming pool has declined over time, is currently under-used, and is to be replaced with more attractive amenities that have higher demand

3.3.12.1.2 Enhanced Recreational Use

The Louisiana Office of State Parks is pursuing the alternative, to renovate and replace existing inadequate or deteriorating recreational infrastructure and service facilities within the St. Bernard State Park to improve the recreational camping experience and increase visitation. The alternative would achieve this goal by renovating the entrance station, a restroom, and a bathhouse; replacing one old bathhouse with a new restroom facility; and removing the underused and outdated swimming pool, replacing it with 20,000-square-foot event pavilion. Each of the alternative elements would help achieve the goals of increased park visitation and improved enjoyment of recreational activities. The replacement restroom and the new pavilion would be expected to accommodate as many as 400 people for an event. The new and remodeled structures would be updated to have a similar architectural style to match the park design and would also improve ADA accessibility in some areas.

The new and renovated St. Bernard State Park entrance station, restroom and bathhouse facilities, and event pavilion would include the following:

- Interior renovations of the entrance facility, including removing and rebuilding interior walls and doors, electrical work, lighting, new exterior windows, and improving ADA compliance
- Renovations of one restroom and one bathhouse including all interior elements and some exterior elements
- Replacement of one existing bathhouse with a new 900- to 1,000-square-foot restroom facility with seven toilets and sinks and five drinking fountains to serve the pavilion
- Removal of pool deck and filling of the existing old swimming pool
- Construction of a 20,000-square-foot metal event pavilion

3.3.12.1.3 Construction Methodology and Schedule

A conceptual design has already been developed. The alternative construction schedule would be determined during E&D, but construction of a project of this kind would typically occur over 4 to 12 months, subject to approval of permits and environmental review. The construction schedule would include contracting, pre-construction, and construction activities. The construction methodology for each of the elements of the alternative are described below.

Entrance station interior renovations would likely include the following tasks: removing, moving, and rebuilding an interior wall with two doors; relocating data lines and electrical outlets; rearranging lighting and adding additional lights, addressing thresholds, door widths, counter heights, ADA-compliance improvements; and installation of new exterior windows at least 3 feet × 4 or 5 feet.

Restroom and bathhouse renovations would involve interior and exterior construction that would be limited to existing footprints. All interior finishes and fixtures would be replaced and repairs to exterior

areas that have wood rot and old weather proofing would be made. Interior finishes would include sinks, toilets, mirrors, toilet partitions, lights, hand dryers, and some floor and wall tile. Exterior repairs would be made to exposed roof elements (soffits, large timber accent pieces, weather proofing and paint). Any doors not replaced after Hurricane Katrina would need to be replaced and some ADA-compliance upgrades would be made. The new restroom would be approximately 900 to 1,000 square feet and would be constructed on the same site after demolition of the bathhouse. The new restroom would have a minimum seven toilets and sinks for each of the two sides of the restroom facility and five drinking fountains, to meet the anticipated user needs. Construction methods and architectural style would match the proposed event pavilion and relate to this region of the state.

For the site preparation for the construction of the new 20,000-square-foot event pavilion, the existing pool deck would be removed, holes would be drilled in the bottom of the existing swimming pool to allow it to drain, the empty pool would be filled and buried, and soils would be compacted to allow construction of the pavilion at this site. The new metal pavilion would be placed on a concrete slab, have a metal roof, and would require utility connections and upgrades.

3.3.12.1.4 Maintenance Requirements

The Louisiana Office of State Parks would be responsible for all maintenance activities and costs related to the new and improved structures, which would include the renovated entrance station, restrooms, and bathhouse facilities and the new pavilion structure, as well as any repairs needed over the life of these structures. After construction of the alternative elements is completed, operators currently servicing the park and fees associated with the park, including camping fees, would not be expected to change from the current system.

3.3.12.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that all elements are constructed as designed, and that the alternative enhances recreational use compared with pre-construction conditions. The Louisiana Office of State Parks would be responsible for performance and use monitoring and for obtaining as-built designs from the project engineer. Monitoring would be designed around improving recreational use of the park through the improvement of the new and existing facilities. Funding for post-construction monitoring is not included in the alternative cost estimate, and would be provided by the Louisiana Office of State Parks. See Appendix C for the MAM plan for the alternative.

3.3.12.2 OIL POLLUTION ACT EVALUATION

3.3.12.2.1 Cost Effectiveness

The cost to implement the alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The estimated cost of the alternative is \$1,098,625 (Table 3.3-6). The alternative has gone through a preliminary design process, but further E&D are needed for implementation. The alternative would be implemented entirely within an existing state park with existing camping and use fees to fund the operation and maintenance of the park. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects.

The estimated cost for the alternative is \$1,098,625, which includes E&D (including pre-construction testing and surveys), construction, and materials for each of the alternative elements (see Table 3.3-6). This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

Table 3.3-6. Construction Cost Estimate - St. Bernard State Park Improvements Alternative

Description	Cost
Entrance Station Renovations Subtotal	\$118,750
Construction and materials	\$95,000
E&D	\$23,750
Restroom and Bathhouse Renovations Subtotal	\$711,125
Construction and materials	\$568,900
E&D	\$142,225
Event Pavilion Subtotal	\$268,750
Construction and materials	\$215,000
E&D	\$53,750
Total (NRDA funds)	\$1,098,625

All work would be awarded in compliance with Louisiana’s public bid laws and regulations, ensuring that the alternative is constructed at current market rates. Projections of operating costs and use were based on other similar projects managed by the Louisiana Office of State Parks.

3.3.12.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. Louisiana Trustees have identified lost recreational opportunities resulting from the DWH Oil Spill. The LA TIG also identified merits of increasing and enhancing the public’s ability to access a variety of recreational resources such as fishing, beach going, camping, and boating in the screening process for this RP/EA. In addition, this inland restoration site addresses lost recreational opportunities that occurred statewide because people in non-coastal areas cancelled trips to the coast during closures related to the DWH Oil Spill. The recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance public access to natural resources for recreational use, as well as enhance recreational experiences for the public through the improvements of infrastructure supporting the use of the State Park’s existing facilities (campsites, picnic area with pavilion, restrooms, and bathhouse). The enhancements would include a renovated park entrance intended to help entice the public to access the park, as well as upgraded restrooms a new bathhouse, and a new event pavilion. These facilities would enhance the public’s recreational experience at the park. For this reason, the alternative’s goal of creating and enhancing visitor access and experiences with recreational activities at the park has a nexus to the public’s loss of recreational uses in Louisiana.

The recreational opportunities that would be created by the alternative are related to the loss of recreational uses that occurred across the Gulf Coast region as a result of the DWH Oil Spill (e.g., lost user-days of outdoor recreation and loss of wildlife viewing). Visitors to the park would likely be the same regional user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location and amenities are inland of the coastal areas directly affected the DWH recreational injury. However, the alternative's benefits would support the use of areas within the geographical footprint of the DWH recreational injury. The alternative's entrance and restroom improvement elements are designed to improve the overall use of the park by improving park amenities to support outdoor recreational users.
- **Scope of benefits:** The scope of benefits for the alternative's infrastructure improvements would be a direct function of capacity use at park and would be measured as part of the alternative's monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. The park is located close to New Orleans, and public transportation is available in the area, which allows for a wide range of public benefactors. No users would be actively excluded by the alternative. During the peak summer season, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative's infrastructure improvements would replace or renovate existing infrastructure construct, an additional bathhouse within the park where outdoor recreation (such as wildlife viewing and camping) is a popular activity. This implies a moderate marginal value for the alternative. The alternative is close to the city of New Orleans and would be available to a large potential visitor population.

3.3.12.2.3 Likelihood of Success

The alternative's goal of enhancing public access to natural resources for recreational use and enhancing recreational experiences has a high likelihood of success. No land acquisition is required, and the Louisiana Office of State Parks has successfully implemented similar recreational infrastructure improvements in support of existing recreational use facilities as part of its day-to-day park management responsibilities. The existing St. Bernard State Park has been operational since 1971 and provides access to natural resources to a large population. The ongoing maintenance and management of the park would not change as a result of the alternative.

3.3.12.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The proposed park facility renovations and construction of new pavilion and restroom facilities would be constructed within the St. Bernard State Park and would require work entirely in uplands. All work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.12.

3.3.12.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to enhance public access to natural resources for recreational use and enhance recreational experiences. Through enhanced recreational infrastructure, including restrooms, event pavilion, and ADA access, the public would better enjoy wildlife viewing at the state park as a secondary benefit.

3.3.12.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by improving camping support infrastructure (i.e., entrance station, restrooms, and bathhouse) quality. The existing restroom facilities are becoming unsanitary and do not meet the current demand. The proposed replacement of restrooms and other renovations would improve the overall health and safety of the park.

3.3.12.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. Although the alternative is located far inland from the coastline, the alternative's benefits would support the recreational and outdoor use of areas within the geographical footprint of the DWH recreational injury. The alternative would provide improved infrastructure for public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.13 Cypremort Point State Park Improvements

3.3.13.1 ALTERNATIVE DESCRIPTION

The Cypremort Point State Park Improvements alternative was submitted by the Louisiana Office of State Parks. The alternative would involve five elements: 1) reinforcing the existing rock jetties, mainly along the entry road, to prevent further erosion on the Quintana Canal side; 2) replacing the breakwater system that previously protected the beach from erosion; 3) restoring the degraded beach to its condition before it was eroded; 4) installing a new marsh boardwalk to replace destroyed fishing piers; and 5) repairing and upgrading existing roads damaged by repeated flooding. The alternative would restore diminishing fishing and recreational opportunities, provide new opportunities for recreational and educational use, restore beach habitat for both recreation and wildlife, and provide protection of coastal nearshore marine habitats and recreational infrastructure.

The alternative is located in both St. Mary and Iberia Parishes approximately 1.5 miles northeast of Cypremort Point in Vermilion Bay (Figure 3.3-13). The area of the alternative starts from Louisiana Highway 319 and extends along Beach Lane and Quintana Canal and includes the entire Cypremort Point State Park site and immediately adjacent offshore area. The alternative address is 306 Beach Lane, Cypremort Point, Louisiana 70538.

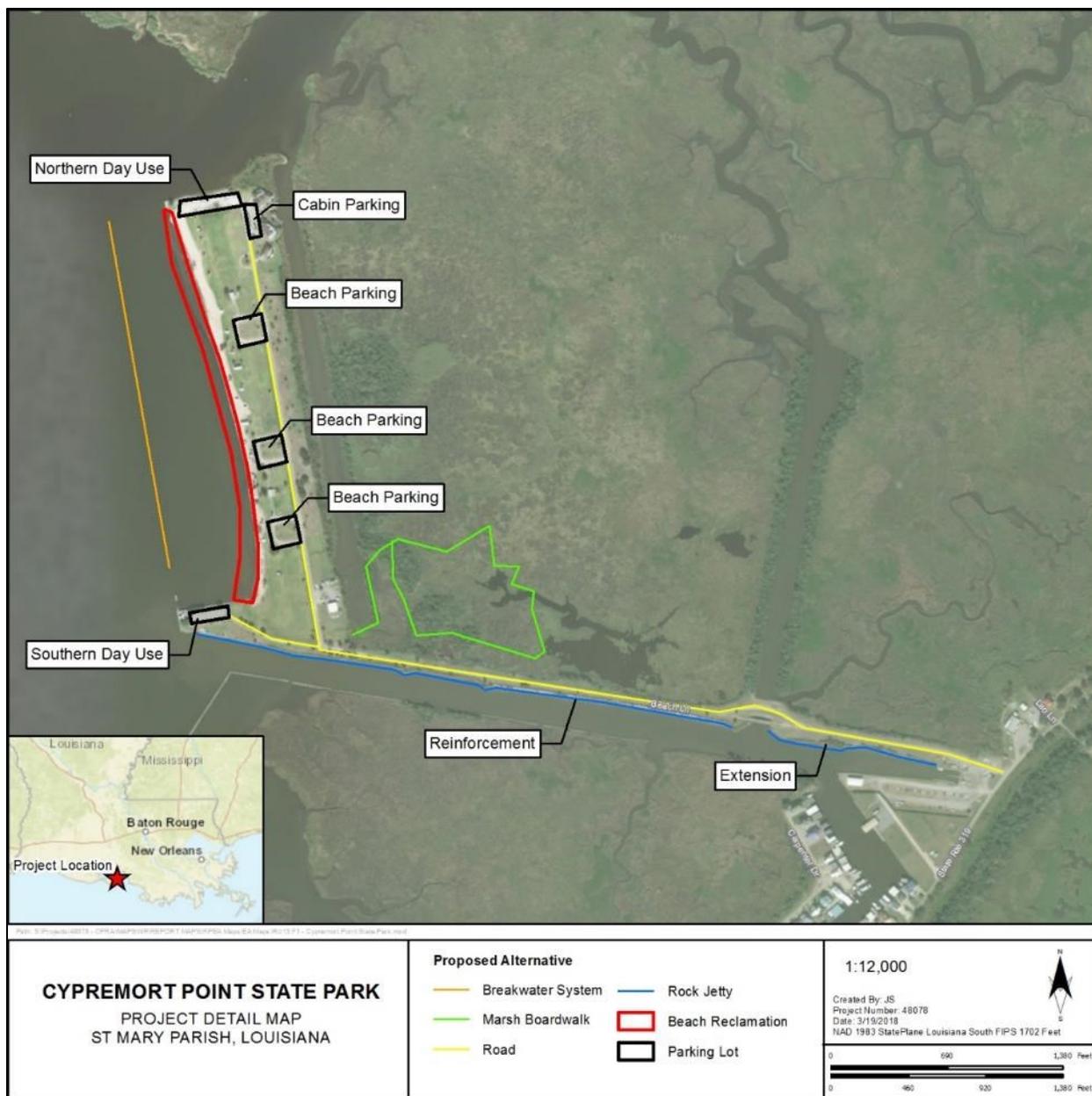


Figure 3.3-13. Location of the Cypremort Point State Park Improvements alternative.

3.3.13.1.1 Current and Historical Recreational Use

The State of Louisiana acquired 40 acres and established the Cypremort Point State Park in 1970. In 2004, the State of Louisiana entered a new lease for an additional 330 acres. The Cypremort Point State Park is one of the few places on the Louisiana Gulf Coast that can be accessed by road. It provides multiple recreational opportunities for both day-use and overnight visitors—including picnicking, fishing, crabbing, water skiing, windsurfing, sailing, camping, and bird and wildlife viewing—through its 0.5-mile-long man-made beach, six cabins, 100-foot-long fishing pier, three pavilions, boat docks, and convenient access to the Cypremort Point boat ramp just outside of the park’s entrance. However, recreational opportunities have been diminished due to deteriorating conditions at the park.

The alternative is in an area that is constantly exposed to erosional forces and storms, which has resulted in degraded conditions in several key areas of the park. Since the creation of the 0.5-mile-long man-made beach, storms and continuous erosional forces have significantly reduced the size and appeal of the exposed beach area, thereby reducing recreational opportunities and use. In addition, the clay sub-soil underneath the beach has been exposed and has also begun to erode. This erosion has reached a historic level and has undercut two beach shade pavilions that are closed as a result. Similarly, the south side of Beach Lane has experienced constant erosion along Quintana Canal from storms and increased boat traffic from the Cypremort Point boat ramp at the head of the canal. This was exacerbated by inadequate erosion protection along the north bank and could cause future safety issues for the park's only access route. In addition, the existing 100-foot-long fishing pier has been damaged from storms to the point that it is unsafe to use, significantly diminishing pier-based fishing opportunities at the park. All of these conditions have had a negative effect on recreational use of the fishing pier and threaten the long-term viability of the site's use.

3.3.13.1.2 Enhanced Recreational Use

The Louisiana Office of State Parks is pursuing the alternative, to restore existing recreational infrastructure and habitats, protect current and future park features, and construct new recreational opportunities in and around the Cypremort Point State Park to improve natural habitats and recreational use of the park. Each of the five alternative elements would address one or more of these goals and are further described below.

Rock Jetties

This element of the alternative would upgrade the existing inadequate rock jetty along the north bank of the Quintana Canal and south side of Beach Lane at the entrance to the Cypremort Point State Park. Upgrades would include extending the existing rock jetty east approximately 1,000 feet to the northern edge of the Cypremort Point boat ramp and reinforcing the remaining approximately 3,300 feet of the existing rock jetty to the northern end of the canal. After improvements, the total rock jetty would be approximately 4,400 feet long × 15 feet wide × 18 inches deep. Rock jetty improvements would provide protection to existing park infrastructure. Improving and expanding the existing erosion protection down most of the length of Beach Lane along Quintana Canal is needed to prevent compromising the entry to the State Park.

Improving the existing rock jetty would include:

- Approximately 1,000-foot-long extension of the existing rock jetty from the cross-canal bridge east to the northern end of the Cypremort Point boat ramp constructed with medium to large rocks
- Approximately 3,300 feet of reinforcement for the existing rock jetty from the cross-canal bridge west to the northern end of the Quintana Canal entrance/exit constructed with medium to large rocks matching the existing material
- Approximately 5,000 to 6,000 tons of rock would be needed for the rock jetty construction and reinforcement

Breakwater System

This element of the alternative would replace the breakwater system with a new system of rock groins approximately 2,100 feet long, 500 feet west of the proposed beach reclamation area. This element of the alternative would provide protection for the park's shoreline from erosional forces that have greatly reduced the quality and appeal of the park's beach area. The proposed breakwater system would greatly increase the long-term success of the proposed beach reclamation. The new breakwater system would provide ecological benefits by protecting the beach habitat and recreational opportunities by protecting the proposed beach reclamation area that has been damaged by erosion and storms.

Replacing the breakwater system would include:

- Seventeen 75-foot-long rock groins, spaced 50 feet apart, constructed with geotextile fabric bases, 6-inch-thick class II base material, core layers of lightweight concrete aggregate, two layers of stone armoring on the side-slopes, and 5-foot-wide crests made up of at least three armor stone units

Beach Reclamation

The proposed beach reclamation would restore the degraded beach area to its previous condition. The beach length is approximately 2,390 feet long and would be restored to approximately 78 feet wide and would need approximately 8,630 cubic yards of sand to reach a depth of 12 inches. The reclamation would include replacing the sub-soil layer as necessary, backfilling and compacting soil under the pavilions experiencing undercutting, and spreading imported sand across the approximately 186,420-square-foot beach shoreline. This beach is a very popular swimming spot, and continued erosion would further degrade beach habitat and also threatens the nearby recreational structures (i.e., pavilions and a restroom facility). The beach provides recreational access for swimming, sun bathing, paddle boards, and other water-based activities, as well as habitat for some shorebirds. Beach reclamation is needed even absent the proposed breakwater system. However, the breakwater system would provide additional erosion protection to the beach, thereby reducing the likelihood of future reclamation at this location.

Marsh Boardwalk to Replace Fishing Piers

The proposed marsh boardwalk system would provide improved recreational fishing opportunities at the inland marsh area north of Beach Lane and east of the Cypremort Point State Park grounds. The Louisiana Office of State Parks determined that replacing/upgrading the existing fishing pier in-place would be subject to the same damaging forces that destroyed the existing pier, and that protection from destruction was not feasible. An inland wooden boardwalk is proposed in the marsh area to the west and would provide fishing and other shoreline-based recreational opportunities. The proposed boardwalk/trail would have a target length of approximately 3,000 feet and be built of mixed media, with most constructed as an above-water boardwalk and some areas constructed at ground level from crushed stone. The boardwalk/trail is intended to provide access to several marsh microenvironments and different inshore water bodies and would be connected to the existing park grounds by a bridge across the canal to the west connecting to the southern portion of the State Park. The boardwalk/trail would restore recreational fishing opportunities for all visitors and improve other recreational uses, such as bird and wildlife viewing and educational opportunities.

Construction of the marsh boardwalk would include:

- Approximately 600 piles driven into the sand bottom to support the boardwalk
- An approximately 3,000-foot-long wooden boardwalk with a width of 4 or 5 feet constructed from 7- to 8-inch pile and either 6×6 or 8×8 marine-grade pressure-treated members and stainless-steel fasteners
- Ground-level trails, where possible, with a width of 4 or 5 feet constructed from crushed stone
- Additional toe rails throughout the boardwalk with handrails at ramps, as well as benches and interpretive signs

Roads

The proposed road repairs in Cypremort Point State Park would address damages associated with repeated flooding. The roads and parking lots provide access to the park including the fishing pier, beach access, cabins, pavilions, boat docks, and restrooms. Repairing the park's roads and parking areas is vital for preserving public access and recreational opportunities to the park's natural resources.

Repairing the existing roads and parking areas would include:

- Four existing 2-way roads, totaling approximately 1.85 miles, with 12-foot-wide travel lanes. Total area of road surface to be repaired is approximately 410,573 square feet. Road improvements would primarily consist of pothole repairs to the road base and a 2-inch asphalt overlay, and includes the following areas:
 - Approximately 1.37-mile-long Beach Lane (park entry)
 - Approximately 0.11-mile-long southern day-use access road
 - Three approximately 0.113-mile-long day-use beach parking access roads
 - Approximately 0.034-mile-long cabin access road
- Six paved parking areas, totaling 116,337 square feet, pothole repairs as needed and a 2-inch asphalt overlay in the following areas:
 - Approximately 15,360-square-foot southern day-use parking lot
 - Three approximately 24,443-square-foot central beach loop parking areas
 - Approximately 20,655-square-foot northern day-use beach parking lot
 - Approximately 6,993-square-foot cabin parking area

3.3.13.1.3 Construction Methodology and Schedule

A conceptual design has already been developed. The alternative construction schedule would be determined during E&D, but it is estimated that if work is done concurrently all work would be complete in 18 to 20 months, or if the work is done in sequence it would take approximately 65 months to complete. The order of construction for various proposed elements would be scheduled in a manner to ensure success (i.e., beach reclamation would occur after the breakwater is replaced). In-water work would total approximately 29 months. All work would be subject to approval of permits and environmental review. The construction schedule would include contracting, pre-construction, and construction activities. The construction methodology for each of the alternative elements are described below.

Rock Jetties

The reinforcement and extension of the existing rock jetty along the northern bank of the Quintana Canal included in the alternative would require placement of medium to large rock material in navigable waters and would likely require some in-water work. The existing jetty would be extended east from the cross-canal bridge on Beach Lane to the northern edge of the Cypremort Point boat ramp, approximately 1,000 feet. This area does not appear to have any existing rocks, with its only erosion protection derived from existing vegetation. Approximately 3,311 feet of an existing rock jetty would be reinforced and extended to approximately 4,400 feet long from the cross-canal bridge west to the northern end of the canal entrance/exit. Existing vegetation would be protected as much as possible. Construction of the proposed jetty improvements would be similar to the construction of the existing jetty and would include placing medium to large rocks, averaging between 100 and 200 pounds each and matching existing jetty material, in the proposed areas with a track hoe or barged heavy equipment. Most of the proposed jetty extensions

would likely be placed from land, limiting in-water work as much as practicable. It is anticipated that 6 months would be needed to complete the design phase of the alternative and 10 months for construction. The in-water work would take approximately 5 months to complete.

Breakwater System

The replacement of the breakwater system would be located approximately 500 feet west of the park's shoreline and would require in-water work and placement of large rock material in navigable water. The proposed breakwater system would include approximately 17 75-foot-long rock groins with 50-foot gaps between each groin, across an approximately 2,100-foot-long area. Each 75-foot-long rock groin would be built up from the sand bottom using a geotextile fabric base, a 6-inch-thick class II base material (i.e., crushed stone or sand and gravel), a core layer of lightweight concrete aggregate, two layers of stone armoring on the side-slopes, and a 5-foot-wide crest made up of at least three armor stone units. The proposed breakwater system would be constructed using barged heavy equipment. It is anticipated that 1 month would be needed to complete the design phase of this element of the alternative and 10 months for construction. The in-water work would take approximately 10 months to complete.

Beach Reclamation

The reclamation of the degraded beach area would be accomplished by importing sand and spreading it within the designated approximately 186,420-square-foot beach shoreline area. This reclamation work would include replacing the sub-soil layer where necessary, backfilling and compacting under the affected pavilions, and replacing the lost sand with new imported sand. The proposed final sand depth would be about 10 to 12 inches deep, with some depth tapering around the edges of the designated beach area to blend to the existing surrounding conditions. The volume of sand needed to complete this phase is estimated at 8,630 cubic yards. The composition of sand required to complete this work would be determined during the E&D phase of construction. It is anticipated that 3 months would be needed to complete the design phase of this element of the alternative and 5 months for construction. The in-water work would take approximately 5 months to complete.

Marsh Boardwalk

Construction of the approximately 3,000-foot-long trail and wooden boardwalk would likely require some in-water work and involve several phases of construction. First, piles would be driven into the marsh sediments along the proposed boardwalk placement, with a set of two piles installed at approximately 10-foot intervals. Each of these piles would be driven past the engineering-set minimum depth into the substrate. These piles would be approximately 6 to 8 feet long to allow for adequate penetration into the marsh sediments, varying water depths, height of water, and vegetation. Construction methods for the boardwalk would be similar to that of other boardwalks and include the use of marine-grade and pressure-treated large timber members and stainless-steel fasteners. Additional boardwalk elements would likely include toe rails, handrails on ramps, benches, and interpretive signs. Some portions of the proposed trail system may consist of ground-level trails constructed from crushed stone. The proposed boardwalk and trail would be either 4 or 5 feet wide. Construction would be conducted from upland areas or previously built sections of the boardwalk as construction progresses along the proposed trail, reducing in-water work. It is anticipated that 6 months would be needed to complete the design phase of this element of the alternative and 12 months for construction. The in-water work would take approximately 12 months to complete.

Roads

To address the roads and parking areas damaged by repeated flooding within the Cypremort Point State Park, the pavement repair would include the Beach Lane (main road), day-use access road, day-use beach parking access roads, cabin access road, southern large parking lot at day-use pavilion and pier, northern day-use beach parking lot, three central beach loop parking areas, and cabin parking area. The identified roads and parking areas throughout the park would receive a 2-inch minimum lift asphalt overlay. The road and parking area improvements would also include minor repairs to the road base where necessary prior to asphalt overlay. The travel lanes for all roads have a footprint of 12 feet wide (typically 14 feet on turns). The overall road length to be re-paved would be approximately 1.85 miles, with an area of approximately 410,573 square feet. The overall parking area to be re-paved would be approximately 116,337 square feet. Some additional minor transition work adjacent to roads and parking lots may be necessary and could include pedestrian routes, sidewalks, light poles, curbs, and signs. Painting of travel lanes would be limited to roadways and parking lots. It is anticipated that 4 months would be needed to complete the design phase of this element of the alternative and 8 months for construction.

3.3.13.1.4 Maintenance Requirements

The Louisiana Office of State Parks would be responsible for all maintenance activities and costs related to the new and improved structures, which would include the new marsh boardwalk and breakwater system, the improved roads and jetties, and restored beach area, as well as any repairs or maintenance needed over the life of these structures. After construction of the alternative elements were completed, operators currently servicing the park and fees associated with the park, including camping fees, would not be expected to change from the current system.

3.3.13.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that all elements are constructed as designed, and that the alternative enhances recreational use compared with pre-construction conditions. The Louisiana Office of State Parks would be responsible for performance and use monitoring and for obtaining as-built designs from the project engineer. Funding for post-construction monitoring is not included in the alternative cost estimate, and would be provided by the Louisiana Office of State Parks. See Appendix C for the MAM plan for the alternative.

3.3.13.2 OIL POLLUTION ACT EVALUATION

3.3.13.2.1 Cost Effectiveness

The cost to implement the Cypremort Point State Park Improvements alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The estimated NRDA-funded cost of the alternative is \$4,477,338 (Table 3.3-7). The alternative has gone through a preliminary design process, and further E&D are needed for implementation of the alternative. The alternative would be implemented entirely within an existing State Park with existing camping and use fees to fund the operation and maintenance of the park. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects.

The estimated cost for the alternative is \$4,477,338, which includes E&D (including pre-construction testing and surveys), construction, and materials for each of the alternative elements (see Table 3.3-7). This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

Table 3.3-7. Construction Cost Estimate - Cypremort Point State Park Improvements Alternative

Description	Cost
Rock Jetty Subtotal	\$1,562,500
Construction and materials	\$1,250,000
E&D	\$312,500
Breakwater System Subtotal	\$1,450,000
Beach Reclamation Subtotal	\$300,000
Marsh Boardwalk Subtotal	\$450,000
Construction and materials	\$360,000
E&D	\$90,000
Road and Parking Repairs Subtotal	\$714,838
Construction and materials	\$571,871
E&D	\$142,967
Total (NRDA funds)	\$4,477,338

All work would be awarded in compliance with Louisiana’s public bid laws and regulations, ensuring that the alternative is constructed at current market rates. Projections of operating costs and use were based on other similar projects managed by the Louisiana Office of State Parks.

3.3.13.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed earlier in this RP/EA, most of the recreational use loss in Louisiana as a result of the spill was to recreational fishing. The recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating. Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational fishing and beachgoing activities (swimming, sunbathing, surfing, walking, kayaking) by both increasing visitation and enhancing the quality of future recreational visits to the area. For this reason, the alternative's goal is to protect coastal shorelines from erosion and restore access to shoreline-based fishing and beach recreational activities. Therefore, the alternative has a strong nexus to the public's lost recreational fishing and access to shoreline uses. The recreational opportunities that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to the park's proposed fishing boardwalk and shoreline beach are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location and amenities are within the geographical footprint of the DWH recreational injury. The alternative's replacement breakwater system, beach reclamation, and new marsh boardwalk elements are designed to benefit boat- and shoreline-based recreational anglers and aid and enhance their ability to access and interact with natural resources in the areas around the Cypremort Point State Park.
- **Scope of benefits:** The scope of benefits for the alternative's beach reclamation and new breakwater system and marsh boardwalk would be a direct function of capacity use at the boat launch and associated features and would be measured as part of the alternative's monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. However, because of a lack of public transportation in the area, benefits would likely accrue primarily to individuals who live on or near Cypremort Point and own, both of which require sufficient disposable income. No users would be actively excluded by the alternative. During the peak summer season, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative's infrastructure would restore and protect the existing degraded beach area and replace a destroyed fishing pier with a new marsh boardwalk to restore fishing and shoreline recreational uses. This implies a high marginal value for the alternative. The alternative is close to multiple communities (including the towns of Jeanerette, Baldwin, and New Iberia, Louisiana); is an approximately 0.5-hour drive from New Iberia, Louisiana; and would be available to a large potential visitor and recreational fishing population

3.3.13.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and enjoyment of shoreline uses has a high likelihood of success. No land acquisition is required, and Louisiana Office of State Parks has successfully implemented similar beach restoration and boardwalk recreational projects as part of its day-to-day park management responsibilities. The existing Cypremort Point State Park has been operational since 2004 and provides access to natural resources to a regional population. The ongoing maintenance and management of the park would not change as a result of the alternative.

3.3.13.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any

net collateral damage to the environment. The beach reclamation and new marsh boardwalk would be constructed within the existing Cypremort Point State Park along Vermilion Bay and would require in-water work for placement of the breakwater system and marsh boardwalk. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.13.

3.3.13.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational fishing, but would also provide enhanced shoreline access and beach going (swimming, sunbathing, surfing, walking, kayaking) and wildlife viewing.

3.3.13.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by permanently closing the deteriorating fishing pier and replacing it with a new marsh boardwalk, reducing erosion of shoreline infrastructure from the construction of the breakwater system, and repairing existing access roads and parking areas damaged by repeated flooding. The alternative elements would improve the overall health and safety of the park.

3.3.13.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new and improved public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.14 The Wetlands Center

3.3.14.1 ALTERNATIVE DESCRIPTION

The Wetlands Center alternative, submitted by the Town of Jean Lafitte, would involve the development of a theater and exhibits inside of the Wetlands Center, as well as a portion of the funding for the Wetlands Center's construction. The alternative would promote and enhance the protection and management of wetland resources and the application of sound science to wetland management efforts through training and educational opportunities. To accomplish this, the alternative proposes construction of the three-level Wetlands Education Center building. This building would serve as an orientation to the wetland ecosystems of Louisiana prior to visitors' exploration of the Nature Study Trail. The building would be designed to house a 4-D theater for educational videos, as well as space for numerous interactive exhibits such as a Mississippi River 3D Projection Map, a model of a Gulf of Mexico oil rig, artifacts of Louisiana's swamp culture in exhibit cases, interactive wetland loss and restoration exhibits, and wildlife interaction exhibits.

The alternative is located in Jefferson Parish, Lafitte, Louisiana, Section 15, Township 15 South, Range 23 East (Figure 3.3-14). The alternative would be constructed at the trailhead of the Town of Jean Lafitte's Nature Study Trail, adjacent to Lafitte's Barataria Museum at 4917 City Park Dr., Jean Lafitte, Louisiana 70067.

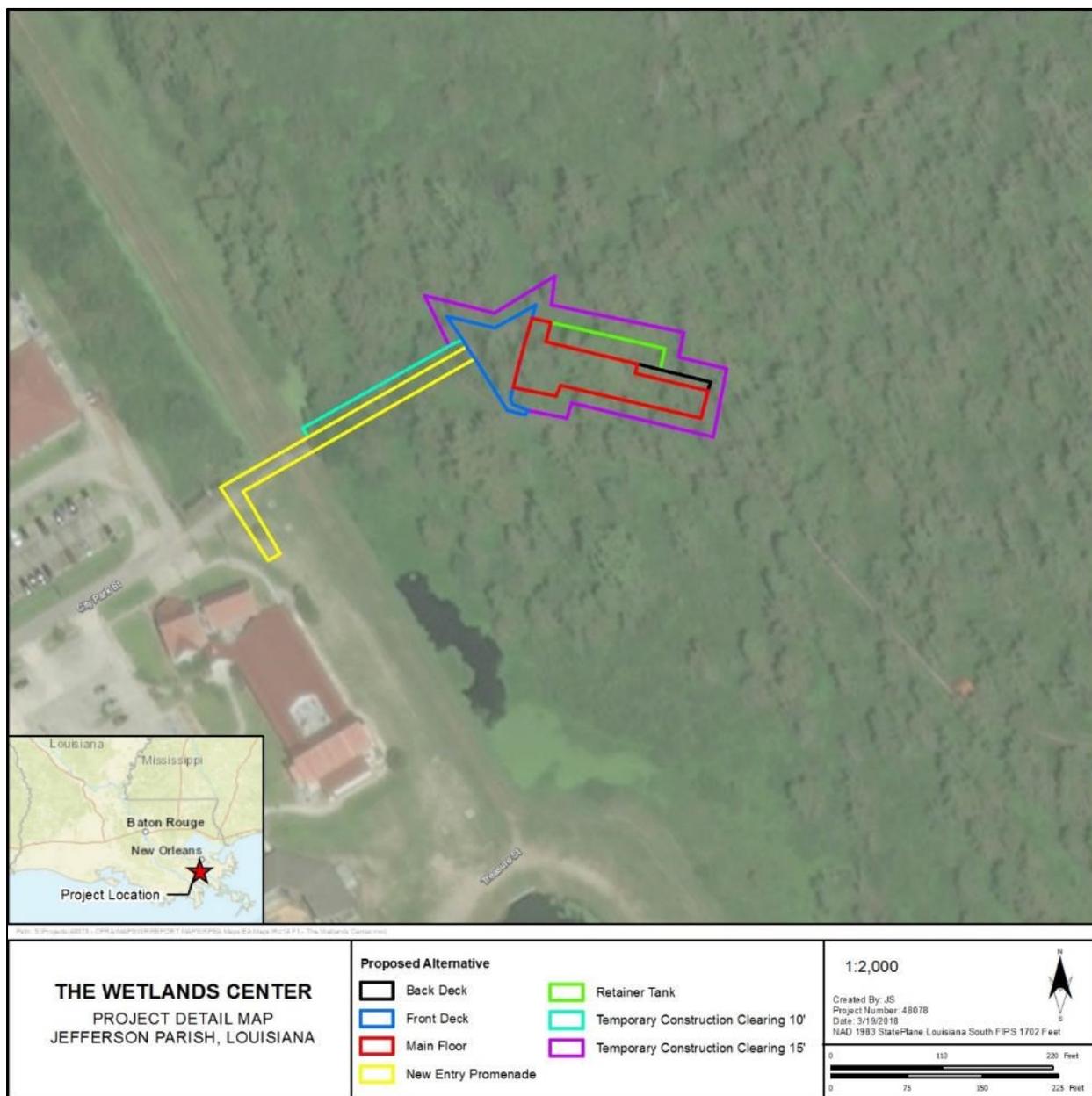


Figure 3.3-14. Location of the Wetlands Center alternative.

Current and Historical Recreational Use

The Wetlands Center is a multi-phased project. Phase 1, which is complete, consisted of the construction of an elevated wooden trail through cypress swamp, referred to as the “Nature Study Trail,” and a Multipurpose Resource Facility with a library, theater for educational films, and a museum depicting the lifestyle and heritage of The Town of Jean Lafitte. The alternative would address Phase 2, the creation of the Wetland Education Center itself. The alternative would serve as an education asset to the region, providing classroom/meeting rooms, exhibits, and observation areas, along with other features to promote preservation, conservation, and adaptation related to wetland ecosystems.

3.3.14.1.1 Enhanced Recreational Use

The alternative would provide funding for a variety of museum-quality exhibits, interactive elements, meeting spaces, and digital media features at the Center, including the following:

- Reception area
- Combination classroom and film viewing theater with seating for approximately 80 students
- Small meeting rooms for private research
- Restoration and preservation of wetlands displays
- Interactive exhibit galleries
- Static exhibit galleries
- Live interactive exhibits
- Large observation windows on all elevations
- Outdoor observation decks
- An observation tower
- Gift shop with snacks and drinks
- First aid station
- Restrooms

The alternative would also provide funding for construction of the three-level Center and entry promenade. The promenade would be approximately 30 feet wide, with approximately 100 linear feet of promenade leading from the existing Multipurpose Resource Facility to the levee at City Park Drive, and approximately 300 linear feet of promenade crossing over the levee and remaining elevated on 8-inch-diameter treated wooden piers, spaced 16 feet across on center, until its connection to the existing trailhead of the elevated Nature Study Trail.

Conceptual designs for the 3,500-square-foot lower level of the Center proposes the building on raised piers. As the alternative proceeds into more detailed design, the exact floor level height would be determined and confirmed in close collaboration with all involved agencies to address flood water levels. Parallel to the northern and eastern sides of the lower level, a clear, polyacrylic wall would be built 20 feet from the building, from just above water level to the water bottom. This polyacrylic wall would serve as a 3,000-square-foot retainer tank for aquatic wildlife viewing.

The 7,300-square-foot main level of the Center would be supported in part by the 3,500-square-foot lower level. Areas of the main level that are not directly above the lower level would be supported by 18-inch-diameter concrete piles. A 4,000-square-foot deck, supported by 8-inch-diameter treated wooden piles, would connect the entry promenade to the main level of the Center and the existing Nature Study Trail. An additional wooden deck would be added on the northeastern corner of the building. Additional viewing opportunities would be provided by a small third-level “lookout tower” above the main level. Additional figures are shown in Appendix E, Figure E-10.

3.3.14.1.2 Construction Methodology and Schedule

Similar exhibit developments typically take approximately 12 to 24 months from start to finish. If construction of the Wetlands Center is included in NRDA funds, timeframes could be longer, subject to approval of permits and environmental review. An estimated 0.77 acre of vegetation clearing would be required within the footprint of the entry promenade, deck, and Center building, as well as a 10-foot

construction buffer adjacent to one side of the promenade footprint and a 15-foot construction buffer around the entirety of the Center building footprint. Roughly 0.5 acre of clearing would be permanent. The remaining 0.27 acre of clearing would be short term and revegetated upon completion of construction. All of the structures would be pier supported, with the exception of the polyacrylic tank. Therefore, an estimated fifty-two 8-inch-diameter piers and sixteen 18-inch piers would be driven into the substrate. Construction methods for the piers would include the use of concrete and marine-grade pressure-treated large timber members and stainless-steel fasteners. The piers would likely be driven using an impact hammer pile (vibratory hammers are typically not used on timber piles) with standard equipment (e.g., crane, boom, set of leads, pile hammer, helmet, pile gate, and pile monkey).

3.3.14.1.3 Maintenance Requirements

The Town of Jean Lafitte would be responsible for all maintenance activities and costs related to the new Center and facility exhibits.

3.3.14.1.4 Monitoring Requirements

Monitoring of the alternative would include ensuring that the alternative is constructed as designed, and that the alternative enhances recreational use compared with pre-construction conditions. The Town of Jean Lafitte would be responsible for performance and use monitoring. Funding for monitoring is not included in the alternative cost estimate, and would be provided by the Town of Jean Lafitte. See Appendix C for the MAM plan for the alternative.

3.3.14.2 OIL POLLUTION ACT EVALUATION

3.3.14.2.1 Cost Effectiveness

The cost to implement the alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The estimated NRDA-funded cost for the alternative is \$2,000,000. The estimated cost represents the best estimates of the Town of Jean Lafitte and does not include funds for operation, maintenance, or monitoring of the alternative. All work would be awarded in compliance with Louisiana's public bid laws and regulations, ensuring that the alternative is constructed at current market rates.

3.3.14.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed in the Final PDARP/PEIS, residents and visitors depend on Gulf Coast resources for varied recreation activities, including boating, fishing, and beach-going. An estimated 17 million boating, fishing, and other shoreline activity user days were lost throughout the five affected states as a result of the spill, with the losses occurring across multiple years (DWH Trustees 2016). The alternative is designed to achieve DWH Trustee goals using the Restoration Approach: "to promote environmental stewardship, education, and outreach." Educational activities provide additional recreational opportunities that improve the connectedness of the public to the environment. These opportunities enhance the community's stewardship of coastal Gulf resources that were injured and, therefore, inaccessible during the DWH Oil Spill and response activities (DWH Trustees 2016). The alternative would address losses through education and engagement of Louisiana residents in the restoration and stewardship of coastal resources. Specifically, the alternative complies with the goal of "Using education and outreach to promote engagement in restoration and stewardship of natural resources, which could include education programs, social media, and print materials" (DWH Trustees 2016).

Improving the connection between communities and natural resources, through education and cultural appreciation would ultimately strengthen environmental stewardship of resources in the Gulf of Mexico and help compensate for human use losses. The alternative aligns with the DWH Trustees strategy indicating that “education and outreach are paramount to the development of this conservation ethic for natural resources. Encouraging better community and environmental stewardship of Gulf resources also contributes to the restoration and conservation of natural resources” (DWH Trustees 2016). The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative’s location and amenities are within the geographic footprint of the DWH recreational injury. The alternative’s Phase 2 is the creation of the Wetland Education Center itself. The alternative would serve as an educational asset to the region, providing classroom/meeting rooms, exhibits, and observation areas, along with other features to promote preservation, conservation, and adaptation related to wetland ecosystems. The alternative’s location in the City of Jean Lafitte within the greater New Orleans metropolitan area provides access to a geographically and demographically diverse audience.
- **Scope of benefits:** The scope of benefits for the alternative’s Wetland Education Center would be a direct function of Phase 2 (construction of the facility) to provide improved education and outreach to the community that was injured as a result of the DWH Oil Spill and promote environmental stewardship of Gulf resources. The new facility has been conceptually designed to provide state-of-the-art educational opportunities including indoor classrooms and exhibits as well as outdoor wetland observation opportunities related to wetlands and other aquatic areas vital to preservation of Coastal Louisiana. The alternative would be developed to meet the accessibility standards required by the ADA. The alternative elements would be measured as part of the monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public because of its location on the greater New Orleans metropolitan area. The alternative is accessible using the Westbank Expressway (off of I-90) existing at the Barataria Boulevard exit, travelling approximately 3.5 miles to the Town of Jean Lafitte. Public transportation options are available for individuals that live within the NORTA and Jefferson Parish Transit service areas.
- **Location:** The alternative would capitalize on the completed Phase I *Create a Multipurpose Resource Facility* that already attracts visitors to encourage existing visitors and entice new visitors to experience educational opportunities including indoor classrooms and exhibits as well as outdoor wetland observation opportunities related to wetlands and other aquatic areas vital to preservation of Coastal Louisiana. The alternative is located within the Town of Jean Lafitte within the greater New Orleans metropolitan area and would be available to a large existing and potential visitor population.

Typical exhibit development projects take approximately 12 to 24 months from start to finish, although timeframes could be longer subject to approval of permits and environmental review. Residents and visitors would be able to benefit from the alternative immediately upon operation; these benefits would persist for the life of the Wetland Education Center. All work would be conducted in compliance with federal, state, and local laws and regulations.

3.3.14.2.3 Likelihood of Success

The alternative’s goal of providing and enhancing recreation opportunities through interpretive exhibits and other educational opportunities has a high likelihood of success. No land acquisition is required, and the Town of Jean Lafitte has successfully implemented, maintained, and operated Phase 1 of the Wetlands Center.

3.3.14.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. For construction of the Center itself, vegetation clearing and pier installation would be required within the footprint of the entry promenade, deck and Center building. All work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.14.

3.3.14.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to promote engagement in restoration and stewardship of natural resources through interpretive exhibits and other educational opportunities, including a classroom and film viewing theater, restoration and preservation of wetlands displays, interactive and static exhibit galleries, observation windows, and outdoor observation decks/tower.

3.3.14.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. No impacts would result from development and installation of the Wetland Education Center exhibits and theater. However, if a portion of NRDA funds was used to support construction of the Wetland Education Center, construction noise impacts would be short term and localized. Construction of the alternative would not substantially alter traffic and could, in fact, provide a net benefit to local residents by providing additional public education and outreach opportunities.

3.3.14.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would improve public awareness, compensate for trust resources that were injured by the DWH Oil Spill, and has a high probability of success. Finally, public safety issues are not expected to be a concern.

3.3.15 *Recreational Use Improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit*

3.3.15.1 ALTERNATIVE DESCRIPTION

NPS is proposing several improvements within the Barataria Preserve Unit (Preserve) of Jean Lafitte National Historical Park and Preserve (park). These improvements would include 1) reconstruction of the Visitor Center (VC) Trail for improved public access in the Preserve, 2) procurement of a Wayside Design Plan for approximately 30 to 35 new wayside exhibits for all of the Barataria boardwalk and dirt trails, and 3) fabrication and installation of approximately seven wayside exhibits along the VC Trail to replace old exhibits or provide new points of education to the public on the Preserve's ecology, issues, and management. Collectively referred to as the alternative, these improvements would provide NPS with the ability to offer enhanced recreational opportunities to benefit both management and public use of the Preserve and the park as a whole.

The alternative is fully located within the Barataria Preserve Unit of the park in Jefferson Parish, near Marrero, Louisiana (Figure 3.3-15; Appendix E, Figure E-11). The Preserve is located approximately 12 miles south of New Orleans. All lands within this area are managed by NPS.



Figure 3.3-15. Location of the Recreational Use Improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit alternative.

3.3.15.1.1 Current Historical Recreational Use

The Preserve was one of the original sites within the park when the park was established in 1978. The Preserve's 22,000-plus acres of bottomland hardwood forest, cypress-tupelo swamp, and fresh to intermediate marsh provide representative examples of coastal Louisiana natural and cultural resources. The Preserve is approximately 12 miles from downtown New Orleans and allows urban residents and

visitors from all over the world to experience and appreciate those resources. The Preserve is the park's leading site based on visitation. Recreational visitation at the Preserve was approximately 229,000 people in 2017, which was approximately 50% of the total visitation for the park that year. Preserve access is by boat and by vehicle along Louisiana Highway 45. Road access connects to five parking lots and 8.5 miles of walking trails (2.7 miles of wooden boardwalks and 5.8 miles of dirt trails).

High-use areas in the Preserve include the Bayou Coquille/Marsh Overlook Trails the VC Trail complex. These trails currently have waysides and interpretive signage, though they are more than 30 years old and in need of updating and replacement. The VC Trail requires improvement as a result of flooding and safety concerns. Also, improvements are needed to be fully ADA compliant. Subsidence in the Preserve has resulted in sections of the trail being regularly flooded. This not only discourages trail use but it also makes the trail unsafe because it introduces slip hazards and guides trail users too close to waters that may have alligators, snakes, and other wildlife.

Current wayside exhibits are old and deteriorating, describe only very basic site history and ecology, and do not reflect the critical challenges facing coastal Louisiana in the twenty-first century including loss of wetlands, impacts of non-native species, recent ecological catastrophes such the DWH Oil Spill and Hurricanes Katrina and Rita, or the interplay between culture and nature.

3.3.15.1.2 Enhanced Recreational Use

To address management needs and increase visitor experience, NPS is proposing multiple improvements (alternative) within the Preserve (Figure 3.3-15) to increase the recreational use experience, including the following:

- Replacing the wooden VC Trail within the Preserve. Improvements to the boardwalk trail would include removing the existing structure and reconstructing it so that it is wider and elevated. The new boardwalk trail would be 5 to 6 feet wide, approximately 1,707 feet long, and approximately 8,535 to 10,242 square feet. Replacing the trail would require removing the current wooden pilings and wooden substructure and decking and replacing them in the same general location with new railings and materials that are more resilient to the ambient conditions. The VC Trail would be ADA compliant, resilient to regular flooding, sustainable, and safer. All VC Trail improvements would be developed within the existing corridor of the VC Trail.
- Procuring a Wayside Design Plan for approximately 30 to 35 new wayside exhibits for all of the Barataria boardwalk and dirt trails.
- Fabricating and installing approximately seven new wayside signs on the improved VC Trail only.

3.3.15.1.3 Construction Methodology and Schedule

The alternative is reliant on completion of CWA Section 404 permitting for the trail's E&D to produce a more accurate construction approach. Overall, NPS expects implementation would take approximately 3 years to complete, subject to approval of permits and completion of consultations and coordination. The trail work's environmental compliance should be completed in 6 to 12 months. E&D would take 6 to 12 months, and construction is anticipated to take up to 1 year.

The alternative includes several features that would require vegetation removal, excavation, and grading. All construction for trails and wayside exhibits would occur within the existing trail corridors (approximately 5 feet wide). For replacement of existing boardwalks, it is anticipated that treated timber or concrete piles would be installed as needed and driven into the substrate to support the proposed new, treated wooden boardwalk. Timber and/or concrete piling is typically used to construct piers, docks

buildings, walkways, and decks in and above aquatic environments. Pressure-treated wood products and concrete are manufactured and installed in a manner that minimizes any potential for adverse impacts to aquatic environments. The piles would be driven using an impact hammer or rotary equipment. Some in-water work may be required for the pilings for boardwalk replacement.

Wayside exhibits proposed would require minimal vegetation removal and excavation (approximately 4-foot-diameter work area) to install the post base within the boardwalk corridor. Some in-water work may also be required.

3.3.15.1.4 Maintenance Requirements

NPS would be responsible for all maintenance activities and costs related to the trail enhancements, and wayside exhibits within the Preserve over the life of use.

3.3.15.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that the proposed improvements are constructed as designed, and that they collectively enhance recreational use compared with current conditions. NPS would be responsible for performance and use monitoring and for obtaining all as-built designs. Monitoring would be designed around the alternative's objective to enhance and increase recreational opportunities within the Preserve. See Appendix C for the MAM plan for the alternative.

3.3.15.2 OIL POLLUTION ACT EVALUATION

3.3.15.2.1 Cost Effectiveness

The cost to implement the Recreational Use Improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. Improvements proposed have gone through a preliminary design process, and further E&D are needed for implementation. A Facility Improvement Plan (FIP) for the Barataria Preserve visitor-use facilities is currently being prepared by NPS and is anticipated to be complete in 2018. Once the FIP is completed, certain scope and cost estimate information associated with the alternative will be more accurate.

The estimated NRDA-funded cost for the alternative is \$1,284,062 based on budget approval (Table 3.3-8). This cost includes the Wayside Design Plan, design and engineering for the VC Trail, design and fabrication of Wayside signs, and construction of the VC Trail. The cost of the FIP is not included in this estimated cost. No land acquisition would be required for the alternative. This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

Table 3.3-8. Construction Cost Estimate (based on current budget estimates) - Recreational Use Improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit Alternative

Description	Cost
Construction of the VC Trail	857,926
E&D for the VC Trail	86,758
Wayside design plan – all Barataria trails	118,930
Wayside signs fabrication and installation (7 each) for the VC Trail	23,982
NPS labor oversight and management) – planning, construction, travel	110,673
Construction contingency for the VC Trail	85,793
Total (NRDA funds)	\$1,284,062

3.3.15.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. The recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating (DWH Trustees 2016). Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing, and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational use experiences by both increasing visitation and enhancing the quality of future recreational visits to the area. The alternative also has a strong nexus to the Trustees’ goals of providing and enhancing recreational opportunities and improving those experiences by maintaining healthy coastal and marine habitats and resources, enhancing public access to these coastal resources, and enhancing the quality of these recreational activities. The recreational opportunities that would be enhanced by the alternative are the same general shoreline uses that were lost as a result of the DWH Oil Spill (e.g., loss of wildlife viewing and shoreline access). Visitors using the Preserve’s proposed enhancements are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative’s location and amenities are within the geographical footprint of the DWH recreational injury. The alternative’s trail and wayside exhibits improvements are designed to be used by shoreline-based recreational users and aid and enhance their ability to access and interact with the natural and cultural resources of the park.
- **Scope of benefits:** The scope of benefits for the alternative’s trail restoration and wayside exhibits improvements would be a direct function of capacity use within the Preserve and associated features and would be measured as part of the monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public, especially those in the New Orleans metropolitan area. No users would be actively excluded by the alternative. During seasonal or other peaks in visitation, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative’s infrastructure improvements would replace or renovate existing access and signage within a high-use area within the park and where recreational activity is easily accessible and popular. This implies a high marginal value for the alternative. The alternative is close to the New Orleans metropolitan area and would be available to a large potential visitor and recreational use population.

3.3.15.2.3 Likelihood of Success

For decades, NPS has successfully designed and built many elevated boardwalks, including in and over aquatic resources, throughout many National Park units across the National Park System, including Congaree National Park, Everglades National Park, Yellowstone National Park, Big Cypress National Preserve, Gulf Islands National Seashore, Big Thicket National Preserve, Cape Cod National Seashore, George Washington Memorial Parkway, and Fire Island National Seashore to name a few. For decades, NPS has also successfully designed and installed educational wayside exhibit throughout dozens, if not hundreds, of National Park units across the National Park System. Because of this extensive experience, the likelihood of success for the alternative is high.

3.3.15.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The trail and signage enhancements would be constructed for the VC Trail within the Preserve and would require both excavation and grading as well as potential or in-water work for all proposed improvements. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.15.

3.3.15.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational opportunities, provide educational opportunities through wayside exhibits, provide opportunities for education ranger and non-ranger led experiences, and provide enhanced shoreline access and wildlife viewing.

3.3.15.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by improving the structure and safety of the VC Trail. The existing boardwalk is deteriorating and needs repairs and safety improvements. Subsidence in the Preserve has resulted in sections of the trail being regularly flooded. This not only prevents trail use but it is also unsafe because it introduces slip hazards and guides pedestrians too close to waters that may have alligators, snakes, and other wildlife.

3.3.15.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new and improved public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.16 Des Allemands Boat Launch

3.3.16.1 ALTERNATIVE DESCRIPTION

The Des Allemands Boat Launch alternative, submitted by St. Charles Parish, would involve construction of a new boat launch facility with four 12-foot-wide boat launch ramps and adjacent fishing piers as Phase 1. The alternative would provide a safe boat launch to access numerous water bodies, including Lake Des Allemands, Petit Lake Des Allemands, Bayou Gauche, Lake Salvador, and Lake Cataouatche and other Barataria Basin waterways in southeast Louisiana. Additional recreation enhancements for Phase 2 would include a restroom building, sewage treatment facility, pavilion, and additional parking, depending on available budget.

St. Charles Parish adopted Ordinance No. 12-6-1 in 2012 that approved an agreement to make an irrevocable donation with the landowner for approximately 3 acres of property. This agreement has expired; therefore, the parish is exploring options with the landowner to renew the previous agreement and acquire approximately 15 acres of property for public recreational use.

The alternative is located in St. Charles Parish on undeveloped land approximately 0.85 mile south of Des Allemands, Louisiana (Figure 3.3-16). The alternative is off Louisiana Highway 632, which links to US Highway 90 in Des Allemands and Louisiana Highway 631 in Bayou Gauche.

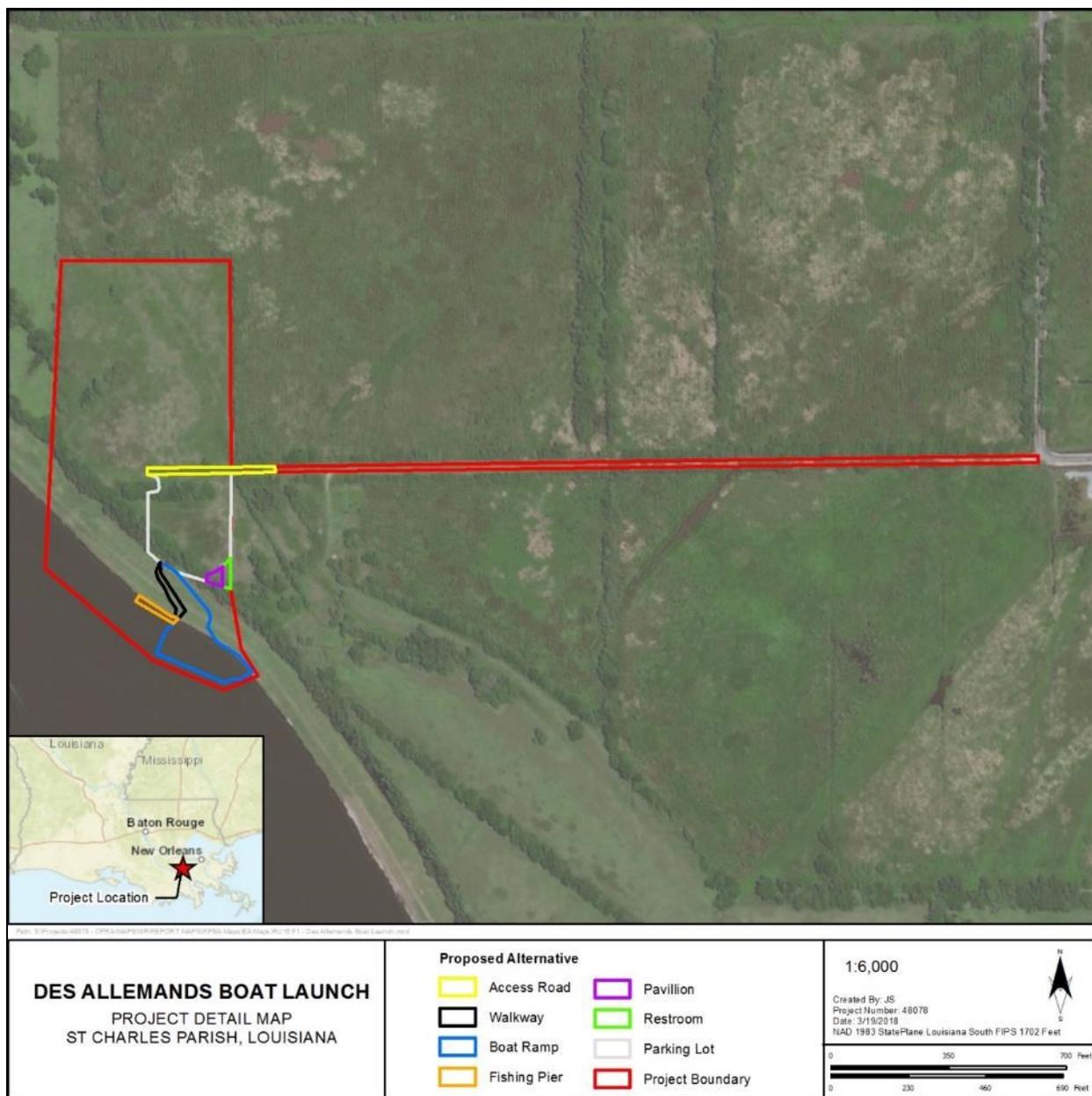


Figure 3.3-16. Location of the Des Allemands Boat Launch alternative.

3.3.16.1.1 Current and Historical Past Recreational Use

The existing site is an undeveloped, approximately 15-acre parcel that is under private ownership. The property was previously under agricultural production; no public recreational use has been recorded for this property.

The alternative would provide public access to the surrounding waterways for various recreational activities such as fishing, hunting, trapping, frogging, trawling, skiing, recreational boating, swimming, and sightseeing. This new public boat launch would replace the existing, single ramp launch located approximately 2 miles to the north under the Highway 90 Bridge crossing. The existing launch has a single ramp with limited parking and unsafe access that requires blocking of public streets to back onto the ramp. Additionally, the existing ramp becomes blocked and unusable by emergency personnel during storm surge events.

3.3.16.1.2 Enhanced Recreational Use

The alternative would include construction of a new boat launch on the east bank of the Bayou Des Allemands. The new boat launch would accommodate parking for up to 60 vehicles hitched to trailers at a time, as well as on-site parking for an additional eight single cars without trailers. In addition, the alternative would include signage, lighting, fishing piers, bulkheads, and an access road from Louisiana Highway 632. For planning purposes, it is assumed that the alternative would permanently impact the entire 15-acre site. Although not all vegetation is anticipated to be removed, the 15-acre site is considered the development envelope (Figure 3.3-16). Additional figures are shown in Appendix E, Figure E-12.

The new launch facility would include construction of the following:

- One 2,415-foot-long × 22-foot-wide asphalt access road with adjacent drainage improvements for boat ramp traffic from Louisiana Highway 632 to the paved parking lot
- One paved parking lot with up to 60 spaces (34 initial and 26 additional as budget allows) large enough to accommodate a vehicle with a trailer as well as eight single car spaces, two of which would be ADA compliant
- One 242-foot-long × 24-foot-wide paved boat ramp from the paved parking lot to the four launch ramps at Bayou Des Allemands
- Four 70-foot-long × 12-foot-wide concrete boat launch ramps with an adjacent approximately 13,500-square-foot maneuvering area
- Three 70-foot-long × 8-foot-wide (560-square-foot each) wooden docks constructed of treated wood
- One 140-foot-long × 7-foot-wide fishing pier constructed of treated wood
- Approximately 385 linear feet of coated steel bulkhead
- One 375-square-foot covered pavilion, as budget allows
- One 250-square-foot, pre-fabricated restroom facility with associated Delta 500 sewer treatment plant, as budget allows
- One 300-foot-long × 5-foot-wide concrete walkway for foot traffic from the pavilion to the parking area, with one additional 350-foot-long × 5-foot-wide timber walkway over the levee to the fishing pier

3.3.16.1.3 Construction Methodology and Schedule

Implementation of the alternative is expected to take approximately 12 months, including final E&D, permitting, contracting, and construction, subject to approval of permits. A conceptual design has already been developed, and preliminary planning has been completed. Final E&D, permitting, and mitigation are anticipated to take approximately four months. Contracting and pre-construction activities are anticipated to take approximately 2 months. Construction is anticipated to take approximately 6 months.

The alternative includes several features that would require vegetation removal, excavation, and grading. The 60-foot right-of-way width for the access road would require clearing and grubbing, general excavation and grading, installation of drainage ditches and culverts, and paving with asphalt. The parking area and 242-foot-long boat ramp from the parking area to the maneuvering area would require clearing and grubbing, general excavation, grading, and fill placement, including approximately 0.15 acre of encroachment into the waterway, for leveling and stabilization of the levee crossing prior to paving with concrete. The approximately 17,000-square-foot (0.4-acre) concrete boat ramp and maneuvering area

would require removal of all riparian vegetation, dredging to provide a minimum water depth, typically 3 feet at the base of the ramps, and placement of fill to create the landing area. Concrete sidewalls covered by coated steel sheet pile would be installed along the sides of the boat ramp to prevent erosion and to provide long-term stability to the structure. Three 70-foot-long × 8-foot-wide (560 total square feet) fixed docks and a 7-foot-wide × 140-foot-long (980-square-foot) fishing pier made of pressure-treated wood would provide access to the alternative from the waterside and could be used by small watercraft to tie-up (e.g., kayaks, pirogues, paddle boards). The fishing pier could also provide pedestrian access from the upland parking and pavilion areas as part of the overall water-oriented recreational enjoyment, which may include bird and wildlife viewing and fishing. An approximately 385-linear-foot bulkhead constructed of coated steel sheet pilings would be installed along the perimeter of the maneuvering area, ramps, and fishing pier also to prevent erosion and to provide long-term stability.

The fishing pier would be installed along the waterfront for a distance of approximately 95 feet, and then turn 90 degrees south to extend an additional 45 feet to the northern most dock. All riparian vegetation along the riparian bank would be removed. Coated steel sheet piling and timber decking is regularly used to construct piers, docks, buildings, walkways, and decks in and above aquatic environments. Pressure-treated wood products are manufactured and installed in a manner that minimizes any potential for adverse impacts to aquatic environments. The piles would typically be driven using an impact hammer pile (vibratory hammers are not typically used on timber piles) with standard equipment (e.g., crane, boom, set of leads, pile hammer, helmet, pile gate, and pile monkey). The crane and associated equipment can be staged either onshore or on a barge in the waterway.

Other materials used for the parking lot, access roads, and footpaths would include stone base course, aggregate surface course, geotextile fabric (laid underneath proposed aggregate and stone-based surfaces), concrete wheel stoppers and pavilion materials (timber, roofing, etc.), and lighting in the parking lot area.

3.3.16.1.4 Maintenance Requirements

St. Charles Parish would be responsible for all maintenance activities and costs related to the alternative, including any repairs needed over the life of the facility. After the alternative is constructed, St. Charles Parish may elect to charge a launch fee to partially fund operation and maintenance of the facility.

3.3.16.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that the alternative is constructed as designed, and that the alternative enhances recreational use compared with pre- construction conditions. St. Charles Parish would be responsible for performance and use monitoring and for obtaining as-built designs from the project engineer. Funding for post-construction monitoring is not included in the alternative cost estimate, and would be the responsibility of St. Charles Parish. See Appendix C for the MAM plan for the alternative.

3.3.16.2 OIL POLLUTION ACT EVALUATION

3.3.16.2.1 Cost Effectiveness

The cost to implement the Des Allemands Boat Launch alternative, with the ancillary facilities, is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The proposed cost of the alternative is \$1,841,116 (Table 3.3-9). The alternative has gone through a preliminary design process, and further E&D are needed for implementation of the alternative. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects. This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

Table 3.3-9. Construction Cost Estimate - Des Allemands Boat Launch Alternative

Description	Cost
Planning	\$110,255
Construction and materials for Phase 1	\$1,301,004
Permits, mitigation, geotechnical and topographic survey	\$71,060
Construction and materials for Phase 2	\$358,797
Total (NRDA funds)	\$1,841,116

All work would be awarded in compliance with Louisiana’s public bid laws and regulations, ensuring that the alternative is constructed at current market rates.

3.3.16.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed earlier in this RP/EA, most of the recreational use loss in Louisiana as a result of the spill was to recreational fishing. The recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating (DWH Trustees 2016). Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing, and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational fishing experiences by both increasing visitation and enhancing the quality of future recreational visits to the area. For this reason, the alternative’s goal of creating and enhancing visitor access to recreational fishing has the added benefit of providing both boat-based and shoreline-based recreational activities and fishing. Therefore, the alternative has a strong nexus to the public’s lost recreational fishing and access to shoreline uses. The recreational opportunities that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to the boat launch and shoreline area are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative’s location and amenities are within the geographical footprint of the DWH recreational injury. The alternative’s parking area, boat launch, and fishing pier elements are designed to be used by boat- and shoreline-based recreational anglers and aid and enhance their ability to access and interact with natural resources in the Bayou Des Allemandes and surrounding area.
- **Scope of benefits:** The scope of benefits for the alternative’s parking areas and boat launch would be a direct function of capacity use at the boat launch and associated features and would be measured as part of the alternative’s monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. However, because of a lack of public transportation in the area, benefits would likely accrue primarily to individuals who live in or near Des Allemands and the greater New Orleans area, and own boats and vehicles to transport them. No users would be actively excluded by the

alternative. During the peak summer season, parking capacity and crowding would limit the total benefits available. St. Charles Parish may elect to charge a launch fee to partially fund operation and maintenance of the facility.

- **Location:** The alternative's infrastructure would provide safe access to a boat launch facility in lieu of a facility that is undersized and experiences overcrowding in an area where recreational fishing is a popular activity. This implies a high marginal value for the alternative. The alternative is close to multiple communities, including the towns of Des Allemands and Houma; is less than an hour drive from New Orleans; and would be available to a large potential visitor and recreational fishing population.

3.3.16.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and enjoyment of shoreline uses has a high likelihood of success. Land acquisition is in progress with St. Charles Parish actively negotiating an expired donation agreement with the willing landowner. St. Charles Parish has also successfully implemented similar recreational boat launches and already has the capacity to maintain and operate the alternative.

3.3.16.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The boat launch and associated facilities would be constructed along Bayou Des Allemands and would require both excavation and grading as well as in-water work for placement of the boat ramp, bulkheads, and docks. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.16.

3.3.16.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational opportunities such as boating and fishing. The alternative also provides enhanced shoreline access and wildlife viewing.

3.3.16.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by closing the existing boat launch and replacing it with the proposed boat launch. The existing boat launch is deteriorating and needs repairs and safety improvements. It does not provide adequate space for parking of vehicles and boat trailers, and the overcrowding presents safety hazards for parked vehicles and ingress and egress activities. To minimize public health impacts, St. Charles Parish would provide routine trash collection and removal services at the alternative.

3.3.16.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new and improved public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.17 Middle Pearl

3.3.17.1 ALTERNATIVE DESCRIPTION

The Middle Pearl alternative, submitted by LDWF, would involve improvement of an existing boat launch facility with two boat launch ramps and a staging slip. The alternative would provide a safe boat launch to access numerous water bodies, including the Middle Pearl River, tributaries to the Pearl River, Little Lake, Lake Pontchartrain, and Lake Borgne in southeast Louisiana. Additional alternative elements would include three floating mooring piers, lighting, signage, upgraded parking, and a boardwalk/dock along the river, depending on available budget.

The alternative is located within the Pearl River State WMA in St. Tammany Parish, to the east of Slidell, Louisiana (Figure 3.3-17). The alternative is on the southern side of Louisiana Highway 90 (Chef Menteur Highway), to the west of the Middle Pearl River.

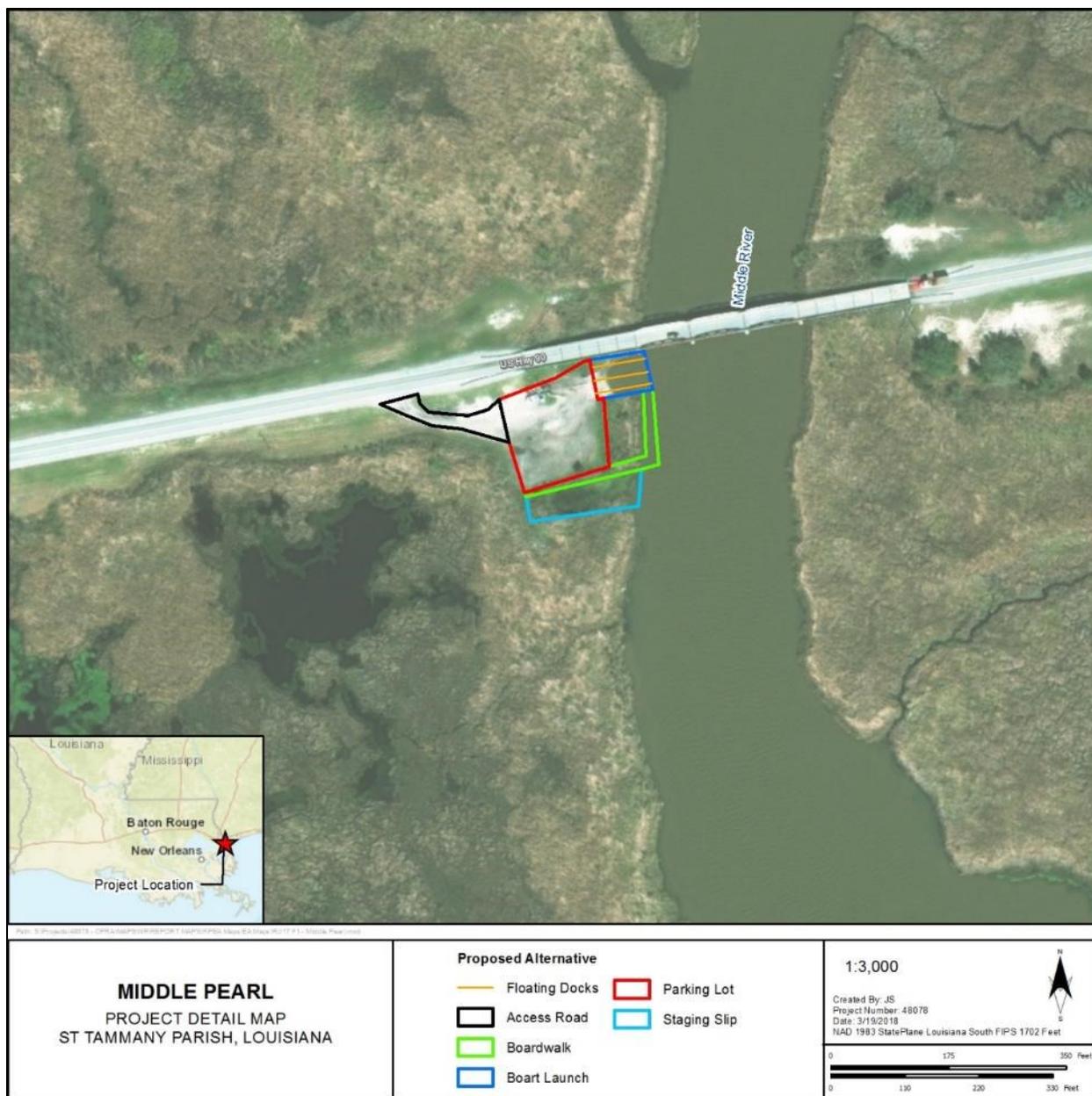


Figure 3.3-17. Location of the Middle Pearl alternative.

3.3.17.1.1 Current and Historical Past Recreational Use

The existing site consists of an unimproved ramp approximately 50 feet in width, an approximately 18-foot-wide \times 150-foot-long access road, an approximately 23,000-square-foot parking area, and an approximately 40 \times 150-foot staging area that has silted in over the past 5 years. The existing site has been used by the public for water access over the past 60 years. The existing launch is deteriorating and in need of stabilization for continued safe use.

3.3.17.1.2 Enhanced Recreational Use

The alternative would provide public access to the surrounding waterways and the Pearl River WMA for various recreational activities such as fishing, hunting, trapping, frogging, skiing, recreational boating, swimming, and sightseeing.

The alternative would include improvement of the existing boat launch on the west bank of the Middle Pearl River. The alternative would accommodate parking for approximately 20 vehicles hitched to trailers, as well as on-site parking for additional single cars without trailers. In addition, the alternative would include signage, lighting, boardwalks/docks around the perimeter of the parking area, and an access road from Louisiana Highway 90. Potential additional alternative elements include increased parking area, a boardwalk/dock on the river frontage, and dredging of the staging slip as budget allows. For planning purposes, it is assumed that the alternative would permanently impact the entire 1-acre site.

The new launch facility would include construction of the following:

- One approximately 200-foot-long × 20-foot-wide access road for boat ramp traffic from Louisiana Highway 90 to the parking lot
- One crushed limestone parking area with up to 20 spaces large enough to accommodate a vehicle with a trailer as well as additional single car spaces
- One 65-foot-long × 45-foot-wide concrete boat launch ramp with room for two lanes
- Three 60-foot-long × 6-foot-wide (1,080-square-foot total) floating docks constructed of treated wood
- One 150-foot-long × 40-foot-wide staging slip, as budget allows
- One 200-foot-long × 6-foot-wide (1,200-square-foot) boardwalk constructed of treated wood to access the staging slip, as budget allows
- One 100-foot-long × 6-foot-wide boardwalk along the riverfront, as budget allows
- Dredging of staging slip, as budget allows

3.3.17.1.3 Construction Methodology and Schedule

The alternative is expected to take approximately 12 months from start to finish, subject to approval of permits and environmental review. A conceptual design has already been developed. Preliminary planning and alternative commencement activities are anticipated to take approximately 3 months. E&D are anticipated to take approximately 5 months. Contracting and pre-construction activities are anticipated to take approximately 3 months. Construction is anticipated to take approximately 2 months.

The alternative includes several features that would require vegetation removal, excavation, and grading. Roadways and parking areas would be surfaced with 6 to 8 inches of crushed limestone. Minor grading of the existing shell/limestone access and parking area would be necessary to improve drainage and prepare the site. The 2,925-square-foot concrete boat launch would have concrete sidewalls covered along the sides of the boat ramp to prevent erosion and to provide long-term stability, typically by vinyl sheet pile. In-water work would consist of the removal of broken concrete and riprap, with minor grading to accommodate the new ramp; no riparian vegetation would require removal. Three floating docks made of treated wood are proposed for the boat ramp, one on each side and one in the center. The floating docks would provide access to the alternative from the waterside and could be used by small watercraft to tie-up (e.g., kayaks, pirogues, paddle boards). A 1,200-square-foot boardwalk made of treated wood would be installed around the parking area and along the staging slip. The docks and boardwalk could also provide pedestrian access from the upland parking area as part of the overall water-oriented recreational enjoyment, which may include bird and wildlife viewing and fishing.

To construct the three 6-foot-wide × 60-foot-long floating docks, no riparian vegetation would need to be removed. Floating docks are typically secured to the river bottom using anchoring weights. The 200-foot-long, 6-foot-wide (1,200-square-foot) wooden boardwalk proposed south of the parking area and the 100-foot-long, 6-foot-wide (600-square-foot) wooden boardwalk proposed along the riverfront would also require a vinyl sheet pile bulkhead that would run parallel to the boardwalk along the shoreline to prevent erosion and to provide stability to the boardwalk. Timber piles would be necessary to support the boardwalk and would be driven into the substrate. Timber piling is typically used to construct piers, docks buildings, walkways, and decks in and above-aquatic environments. Pressure-treated wood products are manufactured and installed in a manner that minimizes any potential for adverse impacts to aquatic environments. The piles would be driven using an impact hammer pile (vibratory hammers are not typically used on timber piles) with standard equipment (e.g., crane, boom, set of leads, pile hammer, helmet, pile gate, and pile monkey). The crane and associated equipment can be staged either onshore or on a barge in the waterway.

Other materials used for the parking lots and access road would include concrete wheel stoppers and improvements to lighting.

3.3.17.1.4 Maintenance Requirements

LDWF would be responsible for all maintenance activities and costs related to the new boat launch, including any repairs needed over the life of the facility.

3.3.17.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that the alternative is constructed as designed, and that the alternative enhances recreational use compared with pre-construction conditions. LDWF would be responsible for performance and use monitoring and for obtaining as-built designs from the project engineer. Funding for post-construction monitoring is not included in the alternative cost estimate and would be provided by LDWF. See Appendix C for the MAM plan for the alternative.

3.3.17.2 OIL POLLUTION ACT EVALUATION

3.3.17.2.1 Cost Effectiveness

The cost to implement the alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The proposed cost of the NRDA-funded portion of the total estimated alternative cost is \$575,000. The alternative has gone through a preliminary design process, and further E&D are needed to implement the alternative. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects.

The estimated cost for the alternative is \$575,000, which includes E&D, construction, materials, and lighting. This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

All work would be awarded in compliance with Louisiana's public bid laws and regulations, ensuring that the alternative is constructed at current market rates. Projections of operating costs and use were based on other similar projects managed by LDWF.

3.3.17.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed earlier in this RP/EA, most of the recreational use loss in Louisiana as a result of the spill was to recreational fishing. The recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating (DWH Trustees 2016). Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing, and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational fishing and hunting experiences by both increasing visitation and enhancing the quality of future recreational visits to the area. For this reason, the alternative's goal of creating and enhancing visitor access to recreational fishing and hunting has the added benefit of providing both boat-based and shoreline-based recreational activities. Therefore, the alternative has a strong nexus to the public's lost recreational fishing and access to shoreline uses. The recreational opportunities that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to the boat launch and shoreline area are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location and amenities are within the geographical footprint of the DWH recreational injury. The alternative's parking area, boat launch, and dock elements are designed to be used by boat- and shoreline-based recreational anglers and hunters. The alternative would aid and enhance their ability to access and interact with natural resources in the Pearl River basin area.
- **Scope of benefits:** The scope of benefits for the alternative's parking area and boat launch would be a direct function of capacity use at the boat launch and associated features and would be measured as part of the alternative's monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. Benefits would likely accrue primarily to individuals who own vehicles. No users would be actively excluded by the alternative. During the peak summer and fall seasons, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative's infrastructure would replace an existing deteriorated boat launch and build two new floating docks and a boardwalk in an area where recreational fishing and hunting are popular activities. This implies a high marginal value for the alternative. The alternative is close to multiple communities (including the towns of Slidell and Pearl River); is less than an hour drive from New Orleans, Louisiana; and would be available to a large potential visitor and recreational fishing population.

3.3.17.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing, hunting, and enjoyment of shoreline uses has a high likelihood of success. No land acquisition is required, and LDWF has successfully implemented similar recreational boat launch projects as part of its day-to-day natural resource management responsibilities. LDWF already has the capacity to maintain and operate the alternative and intends to continue an existing use of the property.

3.3.17.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The boat launch and associated facilities would be constructed along the Middle Pearl River and would require minor excavation and grading as well as in-water work for placement of the boat ramp and docks. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.17.

3.3.17.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational opportunities such as boating, hunting, and fishing. Erosion would be reduced by repairing the existing boat launch and stabilizing the access area. The alternative also provides enhanced shoreline access and wildlife viewing.

3.3.17.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by removing the existing boat launch and replacing it with the proposed boat launch. The existing boat launch is deteriorating and needs repairs and safety improvements. To minimize public health impacts, LDWF would provide routine trash collection and removal services at the 1-acre alternative.

3.3.17.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new and improved public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.18 Improvements to Grand Avoille Boat Launch

3.3.18.1 ALTERNATIVE DESCRIPTION

The Improvements to Grand Avoille Boat Launch alternative, submitted by St. Mary Parish, would replace the existing boat launch (which is deteriorating), provide enhancements to the access road and parking area, and provide mooring piers. The alternative would provide a safe boat launch facility to access numerous water bodies, including Grand Avoille Cove, the Charenton Drainage and Navigation Canal, Bayou Teche, Lake Fausse Pointe, West Cote Blanche Bay, the Atchafalaya River Basin, and the Gulf of Mexico.

St. Mary Parish has obtained a lease for use of the state-owned property from the State of Louisiana. The lease was granted for an initial term of 10 years, commencing on July 22, 2015, with the option for extension. The estimated cost of the alternative is \$247,426.

The alternative is located in St. Mary Parish, to the north of Charenton, Louisiana (Figure 3.3-18). The alternative is on the eastern side of the Charenton Drainage and Navigation Canal and on the western side of the West Atchafalaya Basin Spillway Levee Road.



Figure 3.3-18. Location of the Improvements to Grand Avoille Boat Launch alternative.

3.3.18.1.1 Current and Historical Past Recreational Use

The existing site is owned by the State of Louisiana and has been used by the public for individual camps and water access over the past 60 years. The state originally created three lots, Campsite Lots 8, 9, and 10, to lease for individual campsites. St. Mary Parish leased Campsite Lot 9 and constructed the boat launch to give the public access to the water. An approximately 190 × 90-foot parking area was made available on the lot when the boat launch was constructed. The parking area can accommodate up to 20 vehicles with trailers, assuming a 10-foot-wide space per vehicle. After many years of use, the boat launch is deteriorating and needs repair.

3.3.18.1.2 Enhanced Recreational Use

St. Mary Parish has leased Lot 9 for an annual fee of \$453.00. The lease agreement states that the sole purpose of the lease is for a public boat launch and a public parking area on the property. The alternative would include replacement of the existing boat launch on the 0.54-acre lot. The parking area would be improved by adding 8 inches of crushed limestone, and the access road would be resurfaced with 6 to 8 inches of aggregate. Two timber mooring docks would be constructed to provide enhanced public access to the water for recreational use, including fishing, swimming, boat mooring, and wildlife viewing. For planning purposes, it is assumed that the alternative would permanently impact the entire 0.54-acre site. Although the alternative is primarily enhancement of an existing facility and no vegetation is anticipated to be removed, the 0.54-acre site is considered the development envelope. Additional figures are shown in Appendix E, Figure E-13.

The new launch facility would include construction of the following:

- One approximately 190 × 90-foot parking lot with enough room to accommodate up to 20 vehicles with trailers. The existing 13,856-square-foot parking lot would be topped with 8 inches of compacted limestone
- One 45-foot-long × 30-foot-wide aggregate-covered access road for boat ramp traffic from the West Atchafalaya Basin Spillway Levee Road to the parking lot
- One 20-foot-long × 31-foot-wide concrete boat ramp from the parking lot to the boat launch ramp
- One 20-foot-long × 25-foot-wide boat launch ramp to the Charenton Drainage and Navigation Canal
- Two 24-foot-long × 8-foot-wide wooden docks constructed of treated wood. Six timber piles would be installed per dock

3.3.18.1.3 Construction Methodology and Schedule

The alternative would take approximately 12 months for final design and engineer, permitting, contracting, and construction. A conceptual design has already been developed. Preliminary planning and alternative commencement activities are anticipated to take approximately 3 months. E&D are anticipated to take approximately 5 months. Contracting and pre-construction activities are anticipated to take approximately 3 months. Construction is anticipated to take approximately 2 months.

The alternative includes several features that would require excavation and grading. The access road would be surfaced with up to 8 inches of aggregate; the parking area would be surfaced with 6 to 8 inches of compacted limestone. Minor grading of the existing shell/limestone access and parking area would be necessary to improve drainage and prepare the site. The 1,120-square-foot concrete boat launch and ramp would have concrete sidewalls covered along the sides of the boat ramp to prevent erosion and to provide long-term stability, typically by vinyl sheet pile. In-water work would consist of the removal of broken concrete and riprap, with minor grading to accommodate the new ramp; no riparian vegetation would require removal.

Two timber mooring docks are proposed along each side of the boat ramp. The 8-foot-wide × 24-foot-long docks (192-square-foot area per dock) would be secured to the river bottom using timber piles. Six treated timber piles driven into the substrate would be necessary to support each dock. Timber piling is typically used to construct piers, docks buildings, walkways, and decks in and above-aquatic environments. Pressure-treated wood products are manufactured and installed in a manner that minimizes any potential for adverse impacts to aquatic environments. The piles would be driven using an impact

hammer pile (vibratory hammers are not typically used on timber piles) with standard equipment (e.g., crane, boom, set of leads, pile hammer, helmet, pile gate, and pile monkey). The crane and associated equipment can be staged either onshore or on a barge in the waterway.

Other materials used for the parking lots and access roads would include stone base course, aggregate surface course, and geotextile fabric (laid underneath proposed aggregate and stone-based surfaces).

3.3.18.1.4 Maintenance Requirements

St. Mary Parish would be responsible for all maintenance activities and costs related to the improved boat launch, including any repairs needed over the life of the facility.

3.3.18.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that the alternative is constructed as designed, and that the alternative enhances recreational use compared with pre-construction conditions. St. Mary Parish would be responsible for performance and use monitoring and for obtaining as-built designs from the project engineer. Funding for post-construction monitoring is not included in the alternative cost estimate, and would be the responsibility of St. Mary Parish. See Appendix C for the MAM plan for the alternative.

3.3.18.2 OIL POLLUTION ACT EVALUATION

3.3.18.2.1 Cost Effectiveness

The cost to implement the Improvements to Grand Avoille Boat Launch alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The total NRDA-funded estimated cost of the alternative is \$247,426. The alternative has gone through a preliminary design process, and further E&D are needed to implement the alternative. The land was leased by St. Mary Parish in 2015 for \$453.00 per year, with the expressed purpose of constructing a public boat launch and a public parking area. The estimated construction cost represents the best estimate of the designers and is comparable with the costs of similar projects. This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

All work would be awarded in compliance with Louisiana's public bid laws and regulations, ensuring that the alternative is constructed at current market rates.

3.3.18.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed earlier in this RP/EA, most of the recreational use loss in Louisiana as a result of the spill was to recreational fishing. The recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating (DWH Trustees 2016). Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing, and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational fishing experiences by both increasing visitation and enhancing the quality of future recreational visits to the area. For this reason, the alternative's goal of creating and enhancing visitor access to recreational fishing has the added benefit of providing both boat-based and shoreline-based recreational activities and fishing. Therefore, the alternative has a strong nexus to the public's lost recreational fishing and access to shoreline uses. The recreational opportunities

that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to the boat launch and shoreline area are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location and amenities are within the geographical footprint of the DWH recreational injury. The alternative's parking area, boat launch, and dock elements are designed to be used by boat- and shoreline-based recreational anglers and aid and enhance their ability to access and interact with natural resources in the Atchafalaya River Basin area.
- **Scope of benefits:** The scope of benefits for the alternative's parking area and boat launch would be a direct function of capacity use at the boat launch and associated features and would be measured as part of the alternative's monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. However, because of a lack of public transportation in the area, benefits would likely accrue primarily to individuals who live in or near Charenton, Baldwin, Franklin, and Jeanerette, and own boats and the vehicles to transport them. No users would be actively excluded by the alternative. During the peak summer season, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative's infrastructure would replace an existing deteriorated boat launch facility that is in an area where recreational fishing is a popular activity. This implies a high marginal value for the alternative. The alternative is close to multiple communities (including the towns of Jeanerette and Baldwin, Louisiana); is an approximately 0.5-hour drive from New Iberia, Louisiana; and would be available to a large potential visitor and recreational fishing population.

3.3.18.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and enjoyment of shoreline uses has a high likelihood of success. No land acquisition is required, and St. Mary Parish has successfully implemented similar recreational boat launch projects as part of its day-to-day natural resource management responsibilities, including 27 launches and piers throughout the parish's 660 miles of inland navigable waterways. St. Mary Parish already has the capacity to maintain and operate the alternative and intends to continue an existing use of the property.

3.3.18.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The boat launch and associated facilities would be constructed along the Charenton Drainage and Navigation Canal and would require minor excavation and grading as well as in-water work for placement of the boat ramp and docks. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.18.

3.3.18.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational opportunities such as boating and fishing. The alternative also provides enhanced shoreline access and wildlife viewing.

3.3.18.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by removing the existing boat launch and replacing it with the proposed boat launch. The existing boat launch is deteriorating and needs repairs and safety improvements. To minimize public health impacts, St. Mary Parish would provide routine trash collection and removal services at the 0.54-acre alternative.

3.3.18.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new and improved public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.19 Belle Chasse

3.3.19.1 ALTERNATIVE DESCRIPTION

The Belle Chasse alternative, also known as the Walker Road Boat Launch, submitted by Plaquemines Parish would involve the construction of a new boat launch on the site of what is currently an unimproved public boat launch. The alternative would provide a safe boat launch facility to access numerous water bodies, including Hero Canal, the Gulf Intracoastal Waterway, Barataria Bay, and the Grand Isle area.

Plaquemines Parish owns the property off Walker Road where the boat launch and parking lot are proposed to be located. The new facility is anticipated to have an average of 3,500 users per year. The site is currently used as a boat launch and needs to be improved for safer access.

The alternative is located in Plaquemines Parish, approximately 3 miles southwest of Belle Chasse, Louisiana (Figure 3.3-19). The alternative is on the northern side of the Hero Canal and on the southern side of Walker Road. The alternative is located at 999 Walker Road, Belle Chasse, Louisiana 70037.



Figure 3.3-19. Location of the Belle Chasse alternative.

3.3.19.1.1 Current and Historical Recreational Use

The existing site is owned by Plaquemines Parish and has been used by the public for water access for many years. Existing parking on the site is accomplished by pulling on the side of a dirt road. The parking area can accommodate approximately six vehicles with trailers, assuming a 40-foot-long space per vehicle. After many years of use, the existing boat launch needs repair.

3.3.19.1.2 Enhanced Recreational Use

Plaquemines Parish has stated that it has a need for a public boat launch and a public parking area in the northern Plaquemines Parish area. The alternative would include installation of a pre-cast concrete ramp at the existing boat launch on Walker Road. The currently informal parking area would also be formally designated and constructed by adding 6 to 8 inches of crushed limestone over the existing surface. The boat launch would provide enhanced public access to the water for recreational use, including fishing and boating. For planning purposes, it is assumed that the alternative would permanently impact previously disturbed areas. The alternative is primarily the improvement of an existing facility and no vegetation is anticipated to be removed.

3.3.19.1.3 Construction Methodology and Schedule

The alternative is expected to take approximately 12 months from start to finish, subject to approval of permits and environmental review. A conceptual design has already been developed. Preliminary planning and project commencement activities are anticipated to take approximately 3 months. E&D are anticipated to take approximately 3 months. Contracting and pre-construction activities are anticipated to take approximately 3 months. Construction is anticipated to take approximately 3 months.

The alternative includes several features that may require excavation and grading. It is anticipated that the ramp would be constructed of pre-cast concrete and the parking area would be surfaced with 6 to 8 inches of compacted limestone. Minor grading of the existing access and parking area may be necessary to improve drainage and prepare the site. The approximately 1,500-square-foot boat ramp would likely have concrete sidewalls covered by vinyl sheet pile installed along the sides of the boat ramp to prevent erosion and to provide long-term stability. In-water work would consist of minor excavation and grading to accommodate the new ramp; no riparian vegetation would require removal.

3.3.19.1.4 Maintenance Requirements

Plaquemines Parish would be responsible for all maintenance activities and costs related to the boat launch, including any repairs needed over the life of the facility.

3.3.19.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that the alternative is constructed as designed, and that the alternative enhances recreational use compared with pre-construction conditions. Plaquemines Parish Engineering Department would be responsible for performance and use monitoring and for obtaining as-built designs from the project engineer. Funding for post-construction monitoring is not included in the alternative cost estimate and would be the responsibility of Plaquemines Parish. See Appendix C for the MAM plan for the alternative.

3.3.19.2 OIL POLLUTION ACT EVALUATION

3.3.19.2.1 Cost Effectiveness

The cost to implement the Belle Chasse alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The total estimated NRDA-funded cost of the alternative is \$250,000 (Table 3.3-10). The alternative has gone through a preliminary design process, and further E&D are needed to implement the alternative. The land is owned by Plaquemines Parish and dedicated to the improvement of the public boat launch with public parking area. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects. This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

Table 3.3-10. Construction Cost Estimate - Belle Chasse Alternative

Description	Cost
Professional services	\$57,500
Construction and materials	\$192,500
Total (NRDA funds)	\$250,000

All work would be awarded in compliance with Louisiana’s public bid laws and regulations, ensuring that the alternative is constructed at current market rates.

3.3.19.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed earlier in this RP/EA, most of the recreational use loss in Louisiana as a result of the spill was to recreational fishing. The recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating (DWH Trustees 2016). Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing, and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational fishing experiences by both increasing visitation and enhancing the quality of future recreational visits to the area. For this reason, the alternative’s goal of creating and enhancing visitor access to recreational fishing has the added benefit of providing both boat-based and shoreline-based recreational activities and fishing. Therefore, the alternative has a strong nexus to the public’s lost recreational fishing and access to shoreline uses. The recreational opportunities that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to the boat launch and shoreline area are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative’s location and amenities are within the geographical footprint of the DWH recreational injury. The alternative’s parking area and boat launch are designed to be used by boat- and shoreline-based recreational anglers and aid and enhance their ability to access and interact with natural resources in the Mississippi River Basin area.
- **Scope of benefits:** The scope of benefits for the alternative’s parking area and boat launch would be a direct function of capacity use at the boat launch and associated features and would be measured as part of the alternative’s monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. However, because of a lack of public transportation in the area, benefits would likely accrue primarily to individuals who live in or near Belle Chasse and the greater New Orleans area, and own boats and the vehicles to transport them. No users would be actively excluded by the alternative. During the peak summer season, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative’s infrastructure would replace an existing deteriorated boat launch facility that is in an area where recreational fishing is a popular activity. This implies a high marginal value for the alternative. The alternative is close to multiple communities (including the towns of Belle Chasse and Timberlane, Louisiana); is an approximately 0.5-hour drive from New Orleans, Louisiana; and would be available to a large potential visitor and recreational fishing population.

3.3.19.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and enjoyment of shoreline uses has a high likelihood of success. No land acquisition is required, and Plaquemines Parish has successfully implemented similar recreational boat launch projects as part of its day-to-day natural resource management responsibilities on its extensive waterways. Plaquemines Parish already has the capacity to maintain and operate the alternative and intends to continue an existing use of the property.

3.3.19.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The boat launch and associated facilities would require minor excavation and grading as well as in-water work for placement of the boat ramp. All upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.19.

3.3.19.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational opportunities such as boating and fishing. The alternative also provides enhanced shoreline access and wildlife viewing.

3.3.19.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by removing the existing boat launch and replacing it with the proposed boat launch. The existing boat launch is deteriorating and needs repairs and safety improvements. To minimize public health impacts, Plaquemines Parish would provide routine trash collection and removal services at the alternative.

3.3.19.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide new and improved public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.20 *Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin*

3.3.20.1 ALTERNATIVE DESCRIPTION

The new improvements to the existing Grand Isle Fishing Pier was submitted by the Town of Grand Isle. These proposed improvements are also referred to by the CPRA as the Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin alternative.

The alternative would involve new facilities upon and immediately adjacent to the existing piers to improve accessibility for recreational activities within the Caminada Bay area and the Town of Grand Isle.

The alternative is located in Jefferson Parish in the Town of Grand Isle, Louisiana (Figure 3.3-20). An existing fishing pier (currently being reconstructed) runs immediately adjacent to Louisiana Highway 1 that crosses Caminada Pass.



Figure 3.3-20. Location of the Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin alternative.

3.3.20.1.1 Current and Historical Recreational Use

Since the 1950s the Town of Grand Isle has owned and maintained the Grand Isle Fishing Pier, Louisiana's longest publicly accessible free fishing pier. The pier provides the general public with access to one of the Gulf Coast's prime fishing destination. Originally used as the wooden vehicular bridge for Louisiana Highway 1 across Caminada Pass, the town acquired the structure for use as a fishing pier after the center of the bridge collapsed, necessitating its replacement with the existing adjacent concrete bridge.

Between 2005 and 2009 the wooden pier sustained significant damage from Hurricanes Katrina, Gustav and Ike, requiring major repairs. In 2009, the eastern portion of the pier burned down. The Town of Grand Isle has reconstructed the damaged piers and reopened them to the public, resulting in 2,100 total feet of free recreational access. The reconstructed piers are 20 feet wide and lighted (every 100 feet) to illuminate the pier deck and provide opportunities for night fishing.

3.3.20.1.2 Enhanced Recreational Use

The existing piers provide a popular free public recreational use facility, specifically for fishing opportunities along the Gulf of Mexico. The improved piers have a projected weekday use of 780 people per day, with use rising to 3,900 per day on the weekend. Separate from the reconstruction of the fishing piers, the Town of Grand Isle would like to also improve visitor use experience and accessibility and propose three improvements to facilitate this popular attraction. Collectively, these improvements comprise the alternative and include:

- A 10,800-square-foot (60-foot × 180-foot) PCCP parking lot at the end of each pier (two total parking lots). Each parking lot would have spaces large enough to accommodate a vehicle with a trailer as well as single car spaces.
- Two, 300-square-foot (12-foot × 22-foot) metal shelters located on each pier (four total shelters). Each shelter would have electricity and be lighted and ADA accessible.
- A 200-square-foot (10-foot × 20-foot) concrete masonry unit (CMU) ADA-accessible bathroom facility located at the landing of each fishing pier (two total bathrooms). Each bathroom would be constructed to provide an additional 200-square-foot (10-foot × 20-foot) fish cleaning area under an overhang on the back of the facility. The roof of each bathroom/fish cleaning facility would be composed of a seamless metal product. Each shelter would have electricity and be lighted, and would also have its own sewer treatment plant.

3.3.20.1.3 Construction Methodology and Schedule

The alternative is expected to take approximately 12 to 24 months from start to finish, subject to approval of permits and environmental review. Preliminary planning and E&D are anticipated to take approximately 6 to 12 months. Contracting, pre-construction activities, and construction are anticipated to take approximately 12 to 18 months.

The proposed PCCP parking lots would require some vegetation removal, excavation, and grading. Excavation would occur along the shoreline terrestrial environment for the parking lots for cars and trucks and trailers. The depth of ground disturbance and excavation is expected to be approximately 6 to 14 inches to accommodate the concrete parking lots. No in-water work is anticipated for this improvement. Upon completion of parking lot site preparation, 1,100 square-yards of GeoGrid reinforcement and approximately 200 cubic-yards of a 6-inch-deep limestone base would be installed. Over this sub-material, approximately 1,200 square-yards of PCCP would be poured to a depth of 8 inches thick.

Each shelter would be constructed and located on the piers. No vegetation disturbance of in-water work would be required for development of these facilities. Each shelter would be opened-sided and have a metal roof. Installation of each shelter would require removal and replacement of pier decking. Each facility would be ADA accessible and would have electric dusk to dawn lighting.

Each of the proposed CMU and metal roof bathroom/fish cleaning facilities at each pier landing would also require some vegetation removal, excavation, and grading. No in-water work is anticipated for this improvement. Upon completion of site preparation for the bathroom and sewer treatment system, a foundation would be construction on which to set the facility. Each facility would have electric dusk to dawn lighting.

Construction equipment for staging would likely include bulldozers and graders, a bobcat, and dump trucks. Staging is anticipated to occur within each proposed 10,800-square-foot parking area.

3.3.20.1.4 Maintenance Requirements

The Town of Grand Isle would be responsible for all maintenance activities and costs related to the pier improvements proposed over the life of pier operation. All facilities proposed would be free and open to the public in perpetuity.

3.3.20.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that all facilities are constructed as designed, and that the proposed improvements enhance recreational use compared with pre-construction conditions. The Town of Grand Isle would be responsible for performance and use monitoring and for obtaining as-built designs from their engineer. Monitoring would be designed around the alternative's objective to enhance and increase recreational use and fishing opportunities by development of these public pier improvements. Funding for post-construction monitoring is not included in the proposed cost estimate, and would be provided by the Town of Grand Isle.

3.3.20.2 OIL POLLUTION ACT EVALUATION

3.3.20.2.1 Cost Effectiveness

The cost to implement the Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. Improvements proposed have gone through a preliminary design process, and further E&D are needed for implementation. All improvements proposed are within lands owned and managed by the Town of Grand Isle. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar efforts.

The total estimated NRDA-funded cost for the alternative is \$1,000,000, which includes E&D, construction, and material (Table 3.3-11). This overall cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

Table 3.3-11. Construction Cost Estimate - Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin Alternative

Description	Cost
Fishing Piers Parking Lots – E&D	\$88,700
Fishing Piers Parking Lots – construction and materials	\$279,000
Fishing Piers Parking Lots – contingency	\$55,800
Fishing Piers Subtotal	\$423,500
Pier Shelters – E&D	\$44,800
Pier Shelters – construction and materials	\$116,000
Pier Shelters – contingency	\$23,200
Pier Shelters Subtotal	\$184,000
Bathrooms – E&D	\$59,500
Bathrooms – construction and materials	\$182,000
Bathrooms – contingency	\$30,000
Bathrooms Subtotal	\$271,500
Estimate cost for corrosion resistant materials	\$121,000
Total (NRDA funds)	\$1,000,000

All work proposed would be awarded in compliance with Louisiana’s public bid laws and regulations, ensuring that the improvements are constructed at current market rates. Projections of operating costs and use were based on other similar projects managed by the Town of Grand Isle.

3.3.20.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed earlier in this RP/EA, most of the recreational use loss in Louisiana as a result of the spill was to recreational fishing. The recreational assessment, discussed in the Final PDARP/PEIS, focuses on loss of shoreline use and boating (DWH Trustees 2016). Shoreline use refers to recreational activities conducted by individuals at locations near beaches and other shoreline areas. These activities include swimming, sunbathing, surfing, walking, kayaking, and fishing, and take place from the shoreline or from shoreline structures such as piers. Boating refers to a variety of recreational boating activities that begin at sites providing access to salt water near the Gulf Coast (boat-based fishing is included in this category).

The alternative is designed to enhance recreational fishing experiences by both increasing visitation and enhancing the quality of future recreational visits to the area. For this reason, the alternative’s goal of creating and enhancing visitor access to recreational use (fishing) has the added benefit of shoreline-based recreational activities and fishing. Therefore, the alternative has a strong nexus to the public’s lost recreational fishing and access to shoreline uses. The recreational opportunities that would be created by the alternative are the same shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing and shoreline access). Visitors to the shoreline area are the same user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative’s location and amenities are within the geographical footprint of the DWH recreational injury. The alternative’s pier enhancement elements are designed to be used by shoreline-based recreational anglers and aid and enhance their ability to access and interact with natural resources at Grand Isle.

- **Scope of benefits:** The scope of benefits for the alternative's parking areas, shelters, and bathrooms would be a direct function of capacity use at the fishing piers and would be measured as part of the alternative's monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. No users would be actively excluded by the alternative. During the peak summer season, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative's infrastructure would enhance the existing/improved Caminada Pass piers that experiences high public use in an area where recreational fishing is a popular activity. This implies a high marginal value for the alternative. The alternative is within the Town of Grand Isle and would be available to a large potential visitor and recreational fishing population within Caminada Bay and along the Gulf of Mexico.

3.3.20.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and enjoyment of shoreline uses has a high likelihood of success. No land acquisition is required, and the Town of Grand Isle has successfully implemented similar recreational improvements as part of its day-to-day natural resource management responsibilities. The Town already has the capacity to maintain and operate the alternative.

3.3.20.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The fishing pier enhancements would be constructed in upland areas or on the piers and would require some excavation and grading. In-water work is not anticipated. Regardless, all upland and in-water work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.20.

3.3.20.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to provide and enhance recreational fishing, but would also provide enhanced shoreline access and wildlife viewing. The addition of parking areas would improve access for users seeking shoreline and fishing access.

3.3.20.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to improve and be beneficially impacted by the alternative of improving visitor facilities and safe recreational access. Proposed parking improvements would provide adequate space for parking of vehicles and boat trailers, addressing increased public use and related safety hazards for parked vehicles, and ingress and egress activities. New shelters and bathrooms would facilitate public use and needs for sanitary facilities. To minimize public health impacts, the Town of Grand Isle would continue to provide routine trash collection and removal services along the piers.

3.3.20.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would provide existing public access improvements for trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.21 Palmetto Island State Park Improvements

3.3.21.1 ALTERNATIVE DESCRIPTION

The Palmetto Island State Park Improvements alternative was submitted by the Louisiana Office of State Parks. The alternative would involve multiple elements: construction of a group camp facility, five additional cabins, and an event pavilion to fulfill the park's original Master Plan; enhancing the trail system; and improving access roads and parking lots. The alternative would provide an improved camping experience through new and enhanced camping infrastructure within the state park to accommodate overnight users wishing to access the existing boat launch into the Vermilion River. The alternative would also provide a lagoon boat dock for fishing and other shoreline uses.

The alternative is located in Vermilion Parish within the Palmetto Island State Park, approximately 8 miles south of Abbeville, Louisiana (Figure 3.3-21). The alternative is located from the west bank of the Vermilion River, east to Pleasant Drive, and south to Murphy Road. The alternative's address is 19501 Pleasant Drive, Abbeville, Louisiana 70510.

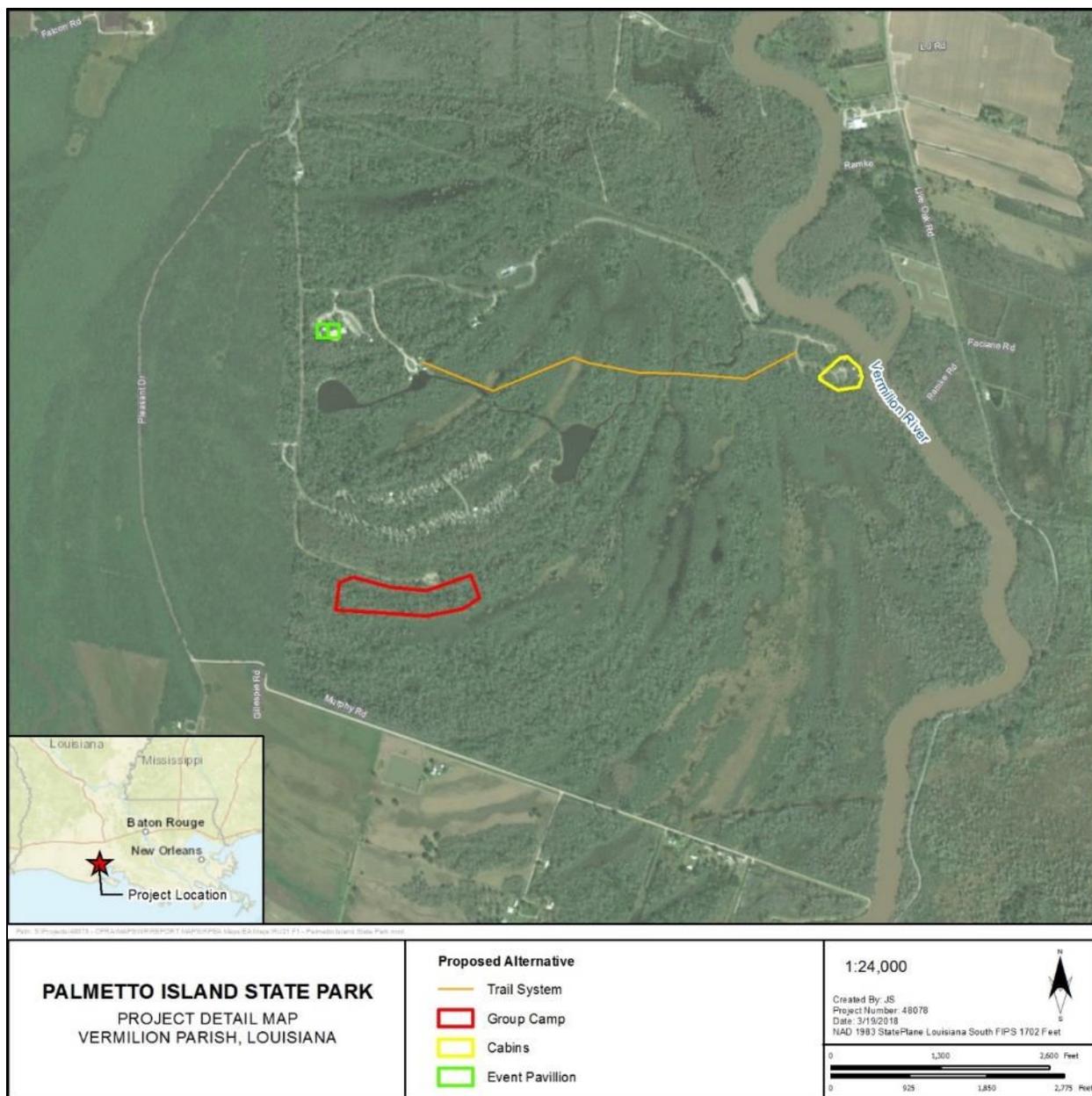


Figure 3.3-21. Location of the Palmetto Island State Park Improvements alternative.

3.3.21.1.1 Current and Historical Recreational Use

The State of Louisiana purchased the 1,299-acre site in 1981 but did not begin construction on it with the intent of public use until 2002. After some delays due to budget constraints and other concerns, the Palmetto Island State Park opened in 2010. The park includes numerous recreational opportunities, including a visitor’s center, six cabins, 96 campsites, water playground, bathhouse, 0.75-mile-long nature trail, boat launch into the Vermilion River, and a boat dock at the lagoon. The Palmetto Island State Park provides access to recreational activities including fishing, camping, boating, canoeing, kayaking, and bird and wildlife viewing. The Palmetto Island State Park is the newest state park in Louisiana and provides numerous recreational opportunities to the public.

3.3.21.1.2 Enhanced Recreational Use

The Palmetto Island State Park's original Master Plan has not been realized, due to budget constraints, but implementation of the plan would greatly expand the existing recreational opportunities within the park. The Louisiana Office of State Parks is pursuing the alternative to construct new recreational features and upgrade existing recreational infrastructure within the Palmetto Island State Park to increase recreational opportunities and use of the park.

The proposed group camp and cabin additions would increase the park's overnight capacity, allowing more people to use the park during peak recreational seasons. In addition, the proposed event pavilion would allow the park to host more special events and larger groups, which would likely increase the park's day use appeal and provide space for public recreational and educational events. The alternative also proposes to enhance the existing trail system and improve access roads and parking lots which would enhance the recreational use of the existing campground infrastructure.

The alternative would include the following elements:

- Construction of a group camp, including two dorm facilities, improved access road and parking lot, and extension of existing park utilities
- Construction of five new cabins, similar to existing cabins in the park, with an average size of 835 square feet with a 170-square-foot porch each, including improving the access road and parking areas, and the extension of park utilities and some landscaping around each of the new cabins
- Construction of an approximately 10,000-square-foot event pavilion
- Enhancing the existing 0.9-mile-long trail system

3.3.21.1.3 Construction Methodology and Schedule

A conceptual design has already been developed. The alternative construction schedule would be determined during E&D, but construction of a project of this kind would typically occur over 3 to 6 months, subject to approval of permits and environmental review. The construction schedule would include contracting, pre-construction, and construction activities. The construction methodology for each of the alternative elements are described below.

Group Camp Facility

The group camp facility's target capacity is 82 persons, with sleeping, restroom, kitchen and dining spaces for all. The preliminary plans call for two dormitory buildings and a common building, the latter containing a kitchen, dining hall, showers, and restrooms. Each dormitory would be 1,798 square feet, and the common building would be 4,907 square feet with a 239 square foot porch, for a total of 8,742 square feet needed for the facilities. Sustainable/resilient finishes, such as solid wood cabinets and cement board exterior siding, would be used in the standard frame construction. All utility's anticipated tie-in lengths would be between 100 to 150 feet. The access road, which is proposed for improvement, is 2,540 feet long by 24 feet wide, for a total of 60,960 square feet. The parking area is 22,800 square feet, which is anticipated to accommodate 51 parking spaces. The access road and parking lot would be overlaid with 1 to 2 inches of asphalt.

Cabins

Five additional cabins would be constructed in the cabin area. Each cabin would have the capacity for sleeping six to eight people, with six beds and a sleeper sofa. Each cabin would be two bedrooms, one bath, with a kitchen/dining area, living room, and a screen porch. Each cabin would be 835 square feet with a 170-square-foot porch for a total of 1,005 square feet needed for each cabin. Sustainable/resilient finishes, such as solid wood cabinets and cement board exterior siding, would be used in standard frame construction. All utility's tie-in lengths would be between 100 to 150 feet. The access road, which is proposed for improvement, is 580 feet long by 24 feet wide, for a total of 13,920 square feet. The parking area is 3,000 square feet and is anticipated to accommodate a minimum of three parking spaces per cabin. The access road and parking areas would be overlaid with 1 to 2 inches of asphalt.

Pavilion

An approximately 10,000-square-foot event pavilion would be constructed near the Visitor Center. It would include a large, covered outdoor space, measuring approximately 67 × 150 feet. The pavilion is anticipated to be wood construction, similar to the architectural style of the surrounding Visitor Center complex buildings. Additional parking in the area, measuring 165 × 62 feet (10,230 square feet), would allow for an additional 33 spaces. All utilities exist in the general Visitor Center complex area, so the anticipated tie-in length would be between 100 and 150 feet.

Trail

Trail improvements would include the expansion of existing trails and connection routes within the park. Some trails would be primarily connections between user areas, such as the cabins and the Visitor Center. Other trails would be nature trails through remote areas of the park, providing access to different environments. Due to the site geography, the trail would need to be a mix of surface trail (approximately 3,500 feet of crushed stone surface trail that follows the natural grade) and elevated boardwalk and bridges (approximately 1,200 feet of elevated boardwalk and bridges). The boardwalk and bridges would have a 5-foot minimum clear width for emergency evacuation equipment. Forty percent of the boardwalk and bridges would have a guardrail, and 60% would have a toe-rail. Ramp sections would require hand rails. Construction would be standard all-wood construction, with materials pressure treated for water contact. Approximately 120 pairs of piles (a total of 240 piles) would be needed for the construction of the boardwalk; pile pairs would be 10 feet apart. Round piles would be 7- to 8-inch butt pile, and nominal post would be either 6 × 6 or 8 × 8. The crushed stone part of the trail would have a cleared width of 5 feet but will only be surfaced at 4 feet wide (14,000 square feet at 4-foot width).

3.3.21.1.4 Maintenance Requirements

The Louisiana Office of State Parks would be responsible for all maintenance activities and costs related to the new and improved structures, which would include the new group camp, five additional cabins, event pavilion, and enhanced trail system, as well as any maintenance and repairs needed over the life of these structures. After construction of the alternative, operators currently servicing the park and fees associated with the park, including camping fees, would not be expected to change from the current system.

3.3.21.1.5 Monitoring Requirements

Monitoring of the alternative would include ensuring that all alternative elements are constructed as designed, and that the alternative enhances recreational use compared with pre- construction conditions. The Louisiana Office of State Parks would be responsible for performance and utilization monitoring and for obtaining as-built designs from the project engineer. Monitoring would be designed around the

objective of increasing recreational use of the park through new camping and event features and improving existing park infrastructure. Funding for post-construction monitoring is not included in the alternative cost estimate, and would be provided by the Louisiana Office of State Parks.

3.3.21.2 OIL POLLUTION ACT EVALUATION

3.3.21.2.1 Cost Effectiveness

The cost to implement the Palmetto Island State Park Improvements alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The estimated NRDA-funded cost of the alternative is \$5,505,825 (Table 3.3-12). The alternative has gone through a preliminary design process, and further E&D are needed to implement the alternative. The alternative would be implemented entirely within an existing State Park with existing camping and use fees to fund the operation and maintenance of the park. The estimated construction costs represent the best estimates of the designers and are comparable with the costs of similar projects.

The estimated cost for the alternative is \$5,505,825, which includes E&D (including pre-construction testing and surveys), construction, and materials for each of the alternative elements (see Table 3.3-12). This cost estimate does not include funds for operation, maintenance, or monitoring of the alternative.

Table 3.3-12. Construction Cost Estimate - Palmetto Island State Park Improvements Alternative

Description	Cost
Group camp	\$2,907,075
New cabins	\$1,951,250
Event pavilion	\$397,500
Nature trail	\$250,000
Total (NRDA funds)	\$5,505,825

All work would be awarded in compliance with Louisiana’s public bid laws and regulations, ensuring that the alternative is constructed at current market rates. Projections of operating costs and utilization were based on other similar projects managed by the Louisiana Office of State Parks.

3.3.21.2.2 Trustee Restoration Goals and Objectives

The alternative has a nexus to the DWH recreational injury.

The alternative is designed to enhance recreational opportunities through the improvements of infrastructure supporting the use of the State Park’s existing boat launch and boat dock, such as overnight campgrounds and day-use pavilions and trails, which would likely increase visitation and enhance the quality of future recreational visits to the area. For this reason, the alternative’s goal of creating and enhancing visitor access to recreational fishing has the added benefit of providing additional terrestrial recreational opportunities. Although the alternative is located inland from the coastline, the boat launch on the Vermilion River has access to Vermilion Bay and the Gulf of Mexico. Therefore, the alternative has a nexus to the public’s lost recreational fishing and access to shoreline uses. The recreational opportunities that would be created by the alternative are similar shoreline uses that were lost as a result of the DWH Oil Spill (e.g., lost user-days of fishing, lost days on the water, and loss of wildlife viewing

and shoreline access). Visitors to the park's boat launch would likely be the same regional user population that the DWH Oil Spill affected and that would benefit from the alternative. The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative's location and amenities are inland of the coastal areas directly affected the DWH reactional injury, but the alternative benefits would support the use of areas within the geographical footprint of the DWH recreational injury. The alternative's new group camp, cabins, and pavilions, along with enhancements to trails and other park infrastructure, are designed to improve the overall use of the park by improving park amenities to support the boat- and shoreline-based recreational anglers and other recreational users.
- **Scope of benefits:** The scope of benefits for the alternative's improved access and use of existing boat launch and shoreline areas would be directly related to camping and park infrastructure improvements that would result in higher usage and would be measured as part of the alternative's monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public. However, because of a lack of public transportation in the area, benefits would likely accrue primarily to individuals who live near the Palmetto Island State Park and own boats and the vehicles to transport them, both of which require sufficient disposable income. Canoes are also available at the park's boat dock for further water-based recreational activities. No users would be actively excluded by the alternative. During the peak summer season, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative's camping and park infrastructure improvements would construct new camping and event opportunities at the park and improve existing park amenities where recreational fishing is a popular activity. This implies a moderate marginal value for the alternative. The alternative is close to multiple communities (including the town of Esther, City of Abbeville, Louisiana, and surrounding towns); is less than a 0.5-hour drive from Abbeville, Louisiana; and would be available to a large potential visitor and recreational fishing population

3.3.21.2.3 Likelihood of Success

The alternative's goal of enhancing public recreational fishing and enjoyment of shoreline uses has a high likelihood of success. No land acquisition is required, and the Louisiana Office of State Parks has successfully implemented similar recreational infrastructure construction and improvements in support of existing boat launches and docks as part of its day-to-day park management responsibilities. The existing Palmetto Island State Park has been operational since 2010 and provides access to natural resources to a regional population. The ongoing maintenance and management of the park would not change as a result of the alternative.

3.3.21.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The group camp, cabins, pavilions, park infrastructure improvements in support of the park's existing boat launch and boat dock would be constructed within the Palmetto Island State Park and would require work predominantly in uplands, with the possibility of

some minor in-water work for the trail enhancements. All work would be conducted in compliance with federal, state, and local laws and regulations. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.21.

3.3.21.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to enhance recreational fishing access as well as to provide enhanced terrestrial camping recreational opportunities, improved shoreline access for wildlife viewing and other uses, and public pavilion space for educational opportunities. The addition of parking areas would improve access for these recreational uses.

3.3.21.2.6 Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. In fact, public health and safety are expected to be beneficially impacted by repairing the trail system. The proposed elements would improve the overall health and safety of the park.

3.3.21.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the infrastructure costs of the alternative are well documented, reasonable, and appropriate. The alternative has a nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. Although the alternative is located inland from the coastline, the boat launch on the Vermilion River has access to Vermilion Bay and the Gulf of Mexico and would provide fishing and water-based recreational opportunities. The alternative would provide improved infrastructure for public access to trust resources that were injured by the DWH Oil Spill and has a high probability of success. Finally, public safety issues are not expected to be a concern and would in fact be improved with the implementation of the alternative.

3.3.22 Louisiana Swamp Exhibit at Audubon Zoo

3.3.22.1 ALTERNATIVE DESCRIPTION

The Louisiana Swamp Exhibit at Audubon Zoo alternative, submitted by the Audubon Nature Institute, would involve updating the existing Louisiana Swamp Exhibit within the Audubon Zoo to promote and enhance the protection and management of coastal ecosystems through interpretive exhibits.

The alternative is located in the Orleans Parish, New Orleans, Louisiana, in Section 13, Township 13 South, Range 11 East and Section 14, Township 13 South, Range 11 East (Figure 3.3-22). The alternative's address is 6500 Magazine St., New Orleans, Louisiana 70118.



Figure 3.3-22. Location of the Louisiana Swamp Exhibit at Audubon Zoo alternative.

3.3.22.1.1 Current and Historical Recreational Use

Audubon Zoo receives approximately one million visitors each year with an emphasis on reaching Louisiana families and school children. The Zoo’s Louisiana Swamp exhibit has received national acclaim for its innovative exploration of the relationships between Louisiana’s people and ecosystem. After more than 30 years, however, updates to the exhibit are warranted to address the ecological and economic importance of Louisiana’s coastal wetlands and to communicate its existing threats and the devastating effect its destruction would have across the country.

3.3.22.1.2 Enhanced Recreational Use

Audubon would refocus interpretive exhibits at the Louisiana Swamp exhibit to inspire visitors to take action to preserve and restore coastal Louisiana. The revitalized Louisiana Swamp exhibit would provide an immersive Louisiana coast experience via small-scale replicas of coastal restoration and protection projects. This experience would allow the public up-close knowledge of the work needed to restore and protect the coast.

3.3.22.1.3 Construction Methodology and Schedule

The alternative is expected to take approximately 12 to 18 months from start to finish. No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on zoo grounds.

3.3.22.1.4 Maintenance Requirements

The Audubon Nature Institute would be responsible for all maintenance activities and costs related to the exhibit. Funds from zoo ticket purchases would help offset exhibit maintenance costs.

3.3.22.1.5 Monitoring Requirements

The Audubon Nature Institute would be responsible for performance and utilization monitoring. Monitoring would be designed around the objective to promote and enhance the protection and management of coastal ecosystems through interpretive exhibits.

3.3.22.2 OIL POLLUTION ACT EVALUATION

3.3.22.2.1 Cost Effectiveness

The cost to implement the Louisiana Swamp Exhibit at Audubon Zoo alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The estimated NRDA-funded cost for the alternative is \$3,000,000. The estimated cost represents the best estimates of the Audubon Nature Institute and does not include funds for operation, maintenance, or monitoring of the alternative. All work would be awarded in compliance with Louisiana's public bid laws and regulations, ensuring that the alternative is constructed at current market rates.

3.3.22.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed in the Final PDARP/PEIS, residents and visitors depend on Gulf Coast resources for varied recreation activities, including boating, fishing, and beach-going. An estimated 17 million boating, fishing, and other shoreline activity user days were lost throughout the five affected states as a result of the spill, with the losses occurring across multiple years (DWH Trustees 2016). The alternative is designed to achieve DWH Trustee goals using the Restoration Approach: "to promote environmental stewardship, education, and outreach." Educational activities provide additional recreational opportunities that improve the connectedness of the public to the environment. These opportunities enhance the community's stewardship of coastal Gulf resources that were injured and, therefore, inaccessible during the DWH Oil Spill and response activities (DWH Trustees 2016). The alternative would address losses through education and engagement of Louisiana residents in the restoration and stewardship of coastal resources. Specifically, the alternative complies with the goal of "Using education and outreach to promote engagement in restoration and stewardship of natural resources, which could include education programs, social media, and print materials" (DWH Trustees 2016).

Improving the connection between communities and natural resources, through education and cultural appreciation, would ultimately strengthen environmental stewardship of resources in the Gulf of Mexico and help compensate for human use losses. The alternative aligns with the DWH Trustees strategy indicating that “education and outreach are paramount to the development of this conservation ethic for natural resources. Encouraging better community and environmental stewardship of Gulf resources also contributes to the restoration and conservation of natural resources” (DWH Trustees 2016). The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative’s location and amenities are within the geographic footprint of the DWH recreational injury. Interpretive exhibits at the Louisiana Swamp exhibit would inspire visitors to take action to preserve and restore coastal Louisiana, allowing the public up-close knowledge of the work needed to restore and protect the coast. Audubon Zoo’s location in the City of New Orleans provides access to a geographically and demographically diverse audience.
- **Scope of benefits:** The scope of benefits for the alternative’s Swamp Exhibit would be a direct function of the ability of existing infrastructure to provide improved education and outreach to the community that was injured as a result of the DWH Oil Spill and promote environmental stewardship of Gulf resources. The new exhibit would be developed completely within existing buildings that already meet the accessibility standards required by the ADA. The alternative elements would be measured as part of the monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public using multiple modes of transportation because of its location on the heart of New Orleans. The alternative is accessed from I-10 West, using the Westbank/Claiborne Ave. exit with a sign at the exit for Audubon Zoo, then travelling approximately 1.5 miles to the address on Magazine Street. From I-10 East, visitors use the South Carrollton Avenue exit, which also has a sign at that exit for Audubon Zoo. The Zoo is accessible using the St. Charles Avenue Streetcar line, which stops in front of Audubon Park. NORTA bus lines 1:Magazine and 32:Leonidas have stops within walking distance of the Zoo’s entrance. Lastly, there are multiple residential neighborhoods within a reasonable 1-mile walking or biking distance from the alternative. No users would be actively excluded by the alternative, but admission fees are required. During the peak season and on weekends and holidays, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative would use existing infrastructure to create new educational opportunities in the City of New Orleans. All proposed activities would occur within an existing structure that is ranked the number nine zoo in the United States, has over 80,000 members, is visited by over 800,000 locals and tourists each year (Audubon Nature Institute 2016), and remains steadfastly popular. The alternative is located within the City of New Orleans metropolitan area and would be available to a large existing and potential visitor population.

3.3.22.2.3 Likelihood of Success

The alternative’s goal of promoting and enhancing the protection and management of coastal ecosystems through interpretive exhibits has a high likelihood of success. No land acquisition is required, and the existing Louisiana Swamp Exhibit is a well-recognized feature of the zoo, which receives roughly one million visitors per year. The Audubon Nature Institute has the capacity to maintain and operate the alternative and intends to use zoo fees to fund the ongoing maintenance and management of the exhibit.

3.3.22.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on zoo grounds. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis in Section 4.6.22.

3.3.22.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to promote engagement in restoration and stewardship of natural resources through interpretive exhibits and other educational opportunities.

3.3.22.2.6 Public Health and Safety

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on zoo grounds. Therefore, there would be no adverse impacts to public health and safety.

3.3.22.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would improve public awareness, compensate for trust resources that were injured by the DWH Oil Spill, and has a high probability of success. Finally, public safety issues are not expected to be a concern.

3.3.23 Louisiana Wetlands Gallery at Audubon Aquarium

3.3.23.1 ALTERNATIVE DESCRIPTION

The Louisiana Wetlands Gallery at Audubon Aquarium alternative, submitted by the Audubon Nature Institute, would involve creating a new gallery focused on Louisiana's coast within the Audubon Aquarium of the Americas. The alternative would promote and enhance the protection and management of coastal ecosystems through educational experiences and exhibits.

The alternative is located in Orleans Parish, New Orleans, Louisiana in Section 13, Township 13 South, Range 11 East, directly on the Mississippi River (Figure 3.3-23). The alternative address is 1 Canal St., New Orleans, Louisiana 70130.



Figure 3.3-23. Location of the Louisiana Wetlands Gallery at Audubon Aquarium alternative.

3.3.23.1.1 Current and Historical Recreational Use

Named the number four aquarium in the United States in 2017, the Audubon Aquarium is the top-ranked aquarium in the region and welcomes one million guests each year, roughly half of which are tourists or visitors from outside the Greater New Orleans area. However, many visitors do not understand the history, complexities, and action necessary to preserve the remaining coast and restore lost wetlands.

3.3.23.1.2 Enhanced Recreational Use

The Audubon Nature Institute would leverage the Audubon Aquarium's existing infrastructure, access to a geographically diverse audience, and proven experience in developing engaging exhibits to create a new gallery focused on Louisiana's coast. The new 7,450-square-foot gallery would exhibit the vast

biodiversity of Louisiana's coast, while conveying the urgency of its fragile state and inspiring guests to take action to protect and restore our coastal ecosystem. The alternative would interweave live animal exhibits and hands-on educational experiences to tell the story of Louisiana's coast and what individual citizens can do to make a difference.

3.3.23.1.3 Construction Methodology and Schedule

The alternative is expected to take approximately 18 to 24 months from start to finish. No new ground disturbance would be required for the alternative. All exhibit development would occur within the existing aquarium.

3.3.23.1.4 Maintenance Requirements

The Audubon Nature Institute would be responsible for all maintenance activities and costs related to the new exhibit. Funds from aquarium ticket purchases would help offset exhibit maintenance costs.

3.3.23.1.5 Monitoring Requirements

The Audubon Nature Institute would be responsible for performance and utilization monitoring. Monitoring would be designed around the objective to promote and enhance the protection and management of coastal ecosystems through educational experiences and exhibits.

3.3.23.2 OIL POLLUTION ACT EVALUATION

3.3.23.2.1 Cost Effectiveness

The cost to implement the Louisiana Wetlands Gallery at Audubon Aquarium alternative is reasonable, appropriate, and comparable to other equivalent restoration alternatives. The estimated NRDA-funded cost for the alternative is \$6,000,000. The estimated cost represents the best estimates of the Audubon Nature Institute and does not include funds for operation, maintenance, or monitoring of the alternative. All work would be awarded in compliance with Louisiana's public bid laws and regulations, ensuring that the alternative is constructed at current market rates.

3.3.23.2.2 Trustee Restoration Goals and Objectives

The alternative has a strong nexus to the DWH recreational injury. As discussed in the Final PDARP/PEIS, residents and visitors depend on Gulf Coast resources for varied recreation activities, including boating, fishing, and beach-going. An estimated 17 million boating, fishing, and other shoreline activity user days were lost throughout the five affected states as a result of the spill, with the losses occurring across multiple years (DWH Trustees 2016). The alternative is designed to achieve DWH Trustee goals using the Restoration Approach: "to promote environmental stewardship, education, and outreach." Educational activities provide additional recreational opportunities that improve the connectedness of the public to the environment. These opportunities enhance the community's stewardship of coastal Gulf resources that were injured and, therefore, inaccessible during the DWH Oil Spill and response activities (DWH Trustees 2016). The alternative would address losses through education and engagement of Louisiana residents in the restoration and stewardship of coastal resources. Specifically, the alternative complies with the goal of "Using education and outreach to promote engagement in restoration and stewardship of natural resources, which could include education programs, social media, and print materials" (DWH Trustees 2016).

Improving the connection between communities and natural resources, through education and cultural appreciation, would ultimately strengthen environmental stewardship of resources in the Gulf of Mexico and help compensate for human use losses. The alternative aligns with the DWH Trustees strategy

indicating that “education and outreach are paramount to the development of this conservation ethic for natural resources. Encouraging better community and environmental stewardship of Gulf resources also contributes to the restoration and conservation of natural resources” (DWH Trustees 2016). The alternative represents in-place, in-kind restoration and is fully consistent with OPA objectives for compensatory restoration. Benefits to injured recreational resources include the following:

- **Component benefits:** The alternative’s location and amenities are within the geographic footprint of the DWH recreational injury. The alternative’s 7,450-square-foot gallery exhibiting the biodiversity and fragility of Louisiana’s coast conveys the urgency to take action to protect and restore the coastal ecosystem. Audubon Nature Institute’s location in New Orleans provides access to a geographically and demographically diverse audience.
- **Scope of benefits:** The scope of benefits for the alternative would be a direct function of the ability of existing infrastructure to provide improved education and outreach to the community that was injured as a result of the DWH Oil Spill and promote environmental stewardship of Gulf resources. The new exhibit would be developed completely within existing buildings that already meet the accessibility standards required by the ADA. The alternative elements would be measured as part of the monitoring plan.
- **Public access:** The recreational benefits of the alternative would be broadly available to the public using multiple modes of transportation because of its location on the heart of New Orleans. The alternative is accessed from I-10 using Poydras Street exit for eastbound travelers and the Canal Street exit for westbound travelers. There are multiple options for public transportation. Both the Riverfront Streetcar Line and the Canal Street Streetcar line have stops adjacent to the Aquarium and many NORTA bus lines have stops on Canal Street including the 5:Marigny-Bywater line. Additionally, the alternative is accessible using the Algiers and Gretna Ferries, which use the Canal Street Ferry Terminal at the foot of Canal Street. Lastly, there are multiple residential neighborhoods within a reasonable 1-mile walking or biking distance from the alternative. No users would be actively excluded by the alternative, but admission fees are required. During the peak season and on weekends and holidays, parking capacity and crowding would limit the total benefits available.
- **Location:** The alternative would use existing infrastructure to create new educational opportunities in the City of New Orleans. All proposed activities would occur within an existing structure that is ranked the number four aquarium in the United States and has been visited by over 23 million people since its opening in 1990 (Audubon Nature Institute 2016) and remains steadfastly popular. The alternative is located within the City of New Orleans metropolitan area and would be available to a large existing and potential visitor population.

3.3.23.2.3 Likelihood of Success

The alternative’s goal of promoting and enhancing the protection and management of coastal ecosystems through interpretive exhibits has a high likelihood of success. No land acquisition is required, and the Audubon Aquarium of the Americas is a top-ranked aquarium in the region that welcomes roughly one million guests each year. The Audubon Nature Institute has the capacity to maintain and operate the alternative and intends to use aquarium fees to fund the ongoing maintenance and management of the exhibit.

3.3.23.2.4 Prevention of Future Injury and Avoid Collateral Injury

The alternative is not expected to play a role in preventing future injury from the spill. The Final PDARP/PEIS indicates that recreational uses have recovered to pre-spill levels (DWH Trustees 2016). The purpose of the alternative is only to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which the Final PDARP/PEIS studies conclude that

recreational use returned to baseline levels. Implementation of the alternative is not expected to cause any net collateral damage to the environment. No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Mississippi River Gallery on aquarium grounds. Additional discussion related to regulatory and permitting requirements for the alternative is provided in the impact analysis Section 4.6.23.

3.3.23.2.5 Benefits to Multiple Resources

The primary NRDA benefit of the alternative would be to promote engagement in restoration and stewardship of natural resources through interpretive exhibits and other educational opportunities.

3.3.23.2.6 Public Health and Safety

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Mississippi River Gallery on aquarium grounds. Therefore, there would be no adverse impacts to public health and safety.

3.3.23.2.7 Alternative Evaluation Summary

The OPA evaluation indicates that the costs of the alternative are well documented, reasonable, and appropriate. The alternative has a strong nexus to the recreational injury caused by the DWH Oil Spill and can reasonably be expected to provide benefits to the public over an extended timeframe. The alternative would improve public awareness, compensate for trust resources that were injured by the DWH Oil Spill, and has a high probability of success. Finally, public safety issues are not expected to be a concern.

3.4 Oil Pollution Act Evaluation Conclusions

The LA TIG has completed its OPA evaluation of eight nutrient reduction alternatives and 23 recreational use alternatives. The OPA analysis indicates that each of these alternatives would provide nutrient reduction and recreational benefits with a strong nexus to the injuries caused by the DWH Oil Spill. The alternatives all occur in the Louisiana Restoration Area.

Each of the nutrient reduction alternatives has a clear nexus to the injuries described in the Final PDARP/PEIS because implementation of CPs on agricultural lands would reduce nutrient enrichment and levels of fecal coliform bacteria to help restore water quality in Gulf of Mexico coastal watersheds. USDA has demonstrated success in developing and implementing the same types of CPs in the watersheds targeted by the alternatives and other similar watersheds. There would be beneficial impacts to water quality in the watershed, which reduces risks to public health and safety. In addition, appropriate safety measures would be followed during CP design and implementation.

Recreational benefits accrue from improved public access and infrastructure associated with recreational fishing locations. These benefits would be broadly available to the public over an extended timeframe. The recreational use alternatives would also benefit other natural resources and services. Infrastructure would be designed and implemented to manage public access in ways that would minimize impacts to valuable habitats and species.

For all alternatives, the restoration approaches would also ensure that any collateral damage to the environment is minor and mitigated. Furthermore, no adverse impacts to public health are anticipated from any of the alternatives.

4 ENVIRONMENTAL ASSESSMENT

4.1 Introduction

Under NEPA, federal agencies must consider the environmental effects of their actions that include impacts on social, cultural, and economic resources, as well as on natural resources. The Final PDARP/PEIS evaluates a range of restoration approaches, thus enabling narrower NEPA analyses for subsequent restoration plans, such as this RP/EA. The subsequent restoration plans are to include project-specific actions, which are presented in this RP/EA as the proposed alternatives. Consistent with 15 CFR 990.23, this section presents the NEPA evaluation of the suite of reasonable alternatives as determined by the OPA evaluation contained in Section 3. This section describes the affected environmental and socioeconomic resources and the anticipated environmental impacts of the proposed action (implementation of the preferred alternatives) and the alternatives not preferred for implementation at this time. This RP/EA tiers from the Final PDARP/PEIS and for this reason, its NEPA analysis refocuses from the programmatic scale of the Final PDARP/PEIS to this subsequent restoration plan prepared by the LA TIG (40 CFR 1502.4(b); 40 CFR 1508.28; 40 CFR 1502.20; and Final PDARP/PEIS, Chapter 6). As a tiered NEPA document, this RP/EA incorporates by reference relevant evaluations of the Final PDARP/PEIS’s Chapter 3 (Ecosystem Setting) and environmental consequences from the Final PDARP/PEIS’s Section 6.4.3 (Restoration Type: Nutrient Reduction (Nonpoint Source) and Section 6.4.13 (Restoration Type: Provide and Enhance Recreational Opportunities).

This RP/EA is consistent with the Final PDARP/PEIS and ROD and provides a NEPA analysis for each proposed alternative, tiering from the Final PDARP/PEIS where appropriate. For this RP/EA, the DWH Trustees considered the extent to which additional NEPA analyses may be necessary for the proposed alternatives that tier their NEPA analyses from the Final PDARP/PEIS. These considerations include whether the analyses of relevant conditions and environmental effects described in the Final PDARP/PEIS are still valid and whether impacts from the alternatives have already been fully analyzed in the Final PDARP/PEIS.

Based on the nature of the alternatives, Table 4.1-1 summarizes the three resource categories analyzed in the Final PDARP/PEIS that were dismissed from detailed analysis in this RP/EA, with rationale.

Table 4.1-1. Resource Categories Dismissed from Detailed Analysis in this RP/EA

Resource Category in Final PDARP/PEIS	Rationale for Dismissal in this RP/EA
Land and Marine Management	The alternatives would not result in changes or impacts to marine management because of either the coastal or in-land location of the alternatives considered in this RP/EA. Impacts to land use and agriculture are discussed in detail for all alternatives.
Fisheries and Aquaculture	The alternatives would not result in impacts to commercial fisheries or aquaculture because of the location and nature of the alternatives considered in this RP/EA. Impacts to essential fish habitat are discussed in detail in each alternative’s Marine and Estuarine Fauna section.
Marine Transportation	The alternatives would not result in changes or impacts to marine transportation because of the inland location of the nutrient reduction alternatives and the localized and recreational use-focus of the recreational use alternatives considered in this RP/EA.

To determine whether an alternative has the potential to result in significant impacts, the context and intensity of the action must be considered. Context refers to area of impacts (local, statewide, etc.) and their duration (e.g., whether they are short- or long-term impacts). Intensity refers to the severity of

impact and could include the timing of the action (more intense impacts would occur during critical periods like high visitation or wildlife breeding/rearing, etc.). Intensity is also described in terms of whether the impact would be beneficial or adverse. For purposes of this document, impacts are characterized as minor, moderate, or major, and short term or long term. The definition of these characterizations is consistent with Section 6 of the Final PDARP/PEIS.

4.2 Affected Environment

This RP/EA analyzes 31 alternatives located across south Louisiana. The Affected Environment section has been organized to capture the broad area over which the implementation of the alternatives may occur (see Figure 1.6-1). Site-specific characteristics are described in more detail in Section 4.5 and Section 4.6 under each of the alternatives.

4.2.1 Physical Environment

4.2.1.1 GEOLOGY AND SUBSTRATES

4.2.1.1.1 Geology

The affected parishes are located in the Deltaic Plains, Chenier Plain, and Alluvial Valley physiographic regions of southern and central Louisiana. Areas that share similar ecological attributes such as vegetation, soils, geology, climate, hydrology, and wildlife can be classified as ecoregions (Lester et al. 2005). Ecoregions identify areas of general ecological similarity, and are designed to serve as the spatial framework for the management and monitoring of ecosystems. Level III ecoregions in Louisiana include the Western Gulf Coastal Plains, South Central Plains, Southeastern Plains, Mississippi Alluvial Plains, Mississippi Valley Loess Plains, and the Southern Coastal Plains (Daigle et al. 2006).

The Western Gulf Coastal Plains consist of relatively flat topography with underlying Quaternary-age alluvial deposits that include Northern Humid Gulf Coastal Prairies, Floodplains and Low Terraces, Texas-Louisiana Coastal Marshes, and Lafayette Loess Plains. Quaternary-age deltaic sands, silts, clays, and gravel underlie much of the Northern Humid Gulf Coast prairies on this gently rolling coastal plain (Daigle et al. 2006). Covered by Holocene alluvial floodplain deposits of the larger and wider streams and bayous, the floodplains and low terraces are distinct from the surrounding prairie uplands. The Texas-Louisiana Coastal Marshes are characterized by extensive saltwater coastal marshes, bays, and lack of barrier islands. The Lafayette Loess Plains are similar to coastal plains but are capped with a loess veneer derived from the Mississippi Valley.

The South Central Plains are composed of rolling plains broken by nearly flat fluvial terraces, bottomlands, sandy low hills, and low cuestas (Daigle et al. 2006), with floodplains and low terraces, including flatwoods. The lithologic mosaic is complex and distinct, with uplands underlain primarily of poorly consolidated Tertiary coastal plain deposits and bottomlands and terraces are veneered with Quaternary alluvium, terrace deposits, and/or loess (Daigle et al. 2006).

The Southeastern Plains, consisting of the Southern Pine Plains and Hills and the Southeastern Floodplains and Low Terraces, are underlain by poorly consolidated Pleistocene and Pliocene deposits and influenced by Pleistocene-age loess deposits. Subsurface materials of the Southern Pine Plains and Hills are composed primarily of Pliocene-age deposits of generally sandy, gravelly, and porous substrate. The Southeastern Floodplains and Low Terrace were derived from substrates of the low-relief region influenced from a mix of sands, silts, and clays influenced by backwaters with ponds, swamps, and oxbow lakes (Daigle et al. 2006).

The Southern Coastal Plains consist primarily of flat floodplains, but include barrier islands, coastal lagoons, marshes, and swampy lowlands (Daigle et al. 2006). The Gulf Coast Flatwoods is a narrow region of level terraces and alluvial and deltaic deposits composed of Quaternary-age sands and clays. Floodplains and low terraces in this region extend from the Southern Coastal Plain of broad floodplains and terraces to the Pearl River composed of stream alluvium and terrace deposits of sand, silt clay, and gravel, along with some organic muck and swamp deposits (Daigle et al. 2006). The Gulf Barrier Islands and Coastal Marshes region was derived from the sediments of the Pearl River deltaic deposits.

The Mississippi Alluvial Plain contains the Southern Holocene Meander Belts, Inland Swamps, and Deltaic Coastal Marshes and Barrier Islands ecoregions (Daigle et al. 2006). The Southern Holocene meander belts are a series of Quaternary-age point bars, oxbows, natural levees, and abandoned channels. The Inland Swamps are transitional from the backswamps at the northern extent of the intratidal basins to the fresh, brackish, and saline waters of the deltaic marshes. Brackish and saline marshes dominate the Deltaic Coastal Marshes and Barrier Islands ecoregion, where extensive organic deposits result in the development of mucky-surfaced Histosols of sediments of silts, clays, and peats (Daigle et al. 2006). Inorganic sediments deposited in these marshes are soft with high water contents that create a severe shrink-swell potential upon draining (Daigle et al. 2006).

The presence of thick deposits of loess is a primary distinguishing characteristic found in the southern rolling plains and the Baton Rouge terrace of the Mississippi Valley Loess Plains (Daigle et al. 2006). The southern rolling plains occur on younger, Pliocene-age geologic formations, with more irregular and dissected topography found in the Mississippi Valley, which is reflected by more diverse and thinner soils. The Baton Rouge terrace occurs on the Pleistocene Prairie Terraces with soils derived primarily from loess parent materials (Daigle et al. 2006). High sodium soils are common in this region.

4.2.1.1.2 Substrates

A vast number of substrates occur throughout the alternatives and are primarily associated with physiographic setting and geologic processes. Primary affected substrates may include mucky, sediment depositions along shorelines rich in organic and inorganic minerals, including clays with a varying amount of silt, sand, and organic content (muck); mud-dominant marginal-deltaic environments capped with organic-rich, mucky sediments in fluid marshes (muck); tidal and eolian depositions of sandy substrates across coastal beaches of the Gulf shores (sands); and silty-dominated, eolian depositions across floodplains and uplands (loess) (NRCS 2017). Substrates throughout these regions are critical components to alluvial, deltaic, fluvial, and intratidal biogeochemical processes, including carbon storage, microbial health, nutrient cycling, and water quality, and are critical in providing habitat for terrestrial and aquatic wildlife.

Soils in the affected parishes are primarily from a variety of Quaternary-age depositional geologies, which have resulted in a diversity of soils across the coastal plains and terraced floodplains of southern Louisiana. Therefore, soils and substrates have been classified based on their primary geomorphic class (NRCS 2017). Primary geomorphic groups identified in the alternatives include backswamps and marshes; beach ridges; coastal plains, delta plains, and floodplains; salt marshes; southwestern prairies; and terraces and natural levees. These broader geomorphic groups are composed of a number of secondary geomorphic subgroups that more closely define the physiographic positioning of these geomorphic subgroups. Additional details for affected soil map units, geomorphic groups, and substrates are presented in Appendix A (NRCS 2017).

4.2.1.2 HYDROLOGY AND WATER QUALITY

Louisiana lies entirely in the Gulf Coastal Plain physiographic province and can be divided into five natural physiographic regions: Coastal Marsh, Mississippi Alluvial Valley, Red River Valley, Terraces, and Hills. Louisiana has 12 major watershed basins. These basins are based on 11 river watersheds plus the Lake Pontchartrain watershed. Maximum elevations in Louisiana are located in the hills of the northwest, where the state's oldest geologic formations are found. The highest elevation in the state is only 535 feet. The lowest elevation in the state is found in the Coastal Marsh region, which extends across the south portion of Louisiana. Because of levee construction, marsh filling, and subsidence, portions of south Louisiana are below sea level rise (Louisiana Department of Environmental Quality [LDEQ] 2016).

Louisiana has a humid subtropical climate influenced by the extensive landmass to the north, the Gulf of Mexico to the south, and the subtropical latitude. Prevalent winds from the south-southeast bring in warm, moist air from the Gulf, resulting in abundant rainfall. The statewide average precipitation varies from 48 inches in the northwest part of the state near Shreveport to 64 inches in the southeast coastal plains near Thibodaux.

4.2.1.2.1 Basins and Impaired Water Bodies

The alternatives are located throughout coastal Louisiana in the inshore, nearshore, and coastal environments. Waters of the U.S. (as defined by the CWA and implementing regulations) and navigable waterways (regulated by the Rivers and Harbors Act) are present at many alternatives. Section 404 of the CWA requires USACE authorization before discharging dredged or fill material into waters of the U.S., including wetlands and special aquatic sites. Under Section 401 of the CWA, projects that entail discharge to wetlands or other waters within federal jurisdiction must obtain state certification of compliance with applicable state water quality standards. Under Section 401, states can review and approve, condition, or deny all federal permits or licenses that might result in a discharge to state waters, including wetlands.

The 11 major hydrologic basins where the alternatives are located are summarized in Table A-3 of Appendix A and shown in Figure 4.2-1.



Figure 4.2-1. Louisiana basins and the alternatives.

Table 4.2-1 provides a summary of the major hydrologic basins within each parish where an alternative is located. The acres of each basin, as it occurs within each parish, is also provided.

Table 4.2-1. Hydrologic Basins by Parish where Project Alternatives are Located

Parish	Basin Name	Basin (acres)
Acadia	Mermentau River Basin	420,762
	Vermillion-Teche Basin	65
Calcasieu	Calcasieu River Basin	503,202
	Mermentau River Basin	49,501
	Sabine	147,123
Cameron	Calcasieu River Basin	317,397
	Mermentau River Basin	480,409
	Sabine	258,779
Catahoula	Ouachita River Basin	412,414
	Red River Basin	61,171
Concordia	Atchafalaya River Basin	14,644
	Mississippi River Basin	62,085
	Ouachita River Basin	11,064
	Red River Basin	391,345
Iberia	Atchafalaya River Basin	71,980
	Terrebonne Basin	3,755
	Vermillion-Teche Basin	325,058
Jefferson	Barataria Basin	196,006
	Mississippi River Basin	6,109
	Lake Pontchartrain Basin	110,044
Jefferson Davis	Calcasieu River Basin	128,181
	Mermentau River Basin	293,261
Lafayette	Mermentau River Basin	30,296
	Vermillion-Teche Basin	142,664
Lafourche	Barataria Basin	492,906
	Terrebonne Basin	269,202
Orleans	Barataria Basin	11,240
	Mississippi River Basin	4,046
	Lake Pontchartrain Basin	208,397
Plaquemines	Barataria Basin	288,724
	Mississippi River Basin	157,623
	Lake Pontchartrain Basin	219,364
St. Bernard	Mississippi River Basin	1,864
	Lake Pontchartrain Basin	306,533
St. Charles	Barataria Basin	179,101
	Mississippi River Basin	7,467
	Lake Pontchartrain Basin	75,902
St. Helena	Lake Pontchartrain Basin	262,059
St. Martin	Atchafalaya River Basin	298,876
	Terrebonne Basin	26,584
	Vermillion-Teche Basin	197,012
St. Mary	Atchafalaya River Basin	207,235
	Terrebonne Basin	30,532
	Vermillion-Teche Basin	203,391
St. Tammany	Pearl River Basin	174,316
	Lake Pontchartrain Basin	536,008
Tangipahoa	Pearl River Basin	11,886
	Lake Pontchartrain Basin	514,895

Parish	Basin Name	Basin (acres)
Tensas	Mississippi River Basin	61,044
	Ouachita River Basin	348,969
	Red River Basin	642
Terrebonne	Atchafalaya River Basin	2,973
	Terrebonne Basin	944,88
Vermilion	Mermentau River Basin	572,795
	Vermilion-Teche Basin	259,643
Washington	Pearl River Basin	390,622
	Lake Pontchartrain Basin	41,912

Within these basins, 1,461 subsegments, as defined by LDEQ, are listed as impaired (LDEQ 2016; Table 4.2-2). An impaired subsegment indicates that the particular segment of a water body does not support the designated use because of suspected causes such as turbidity, fecal coliform, mercury in fish, and other causes (LDEQ 2016). Section 402 of the CWA establishes the National Pollutant Discharge Elimination System (NPDES) permit program to regulate point source discharges of pollutants into waters of the U.S. An NPDES permit sets specific limits for point sources discharging pollutants into waters of the U.S. and establishes monitoring and reporting requirements, as well as special conditions. EPA is charged with administering the permit program and has authorized Louisiana to issue NPDES permits.

Table 4.2-2. Impaired Subsegments by Basin

Basin Name	Number of Impaired Subsegments	Impaired Designated Uses
Atchafalaya River Basin	38	Primary Contact Recreation (swimming) Secondary Contact Recreation (boating) Fish and Wildlife Propagation (fishing) Oyster Propagation
Barataria Basin	66	Primary Contact Recreation (swimming) Fish and Wildlife Propagation (fishing) Outstanding Natural Resource
Calcasieu River Basin	163	Primary Contact Recreation (swimming) Secondary Contact Recreation (boating) Fish and Wildlife Propagation (fishing) Drinking Water Supply
Lake Pontchartrain Basin	196	Primary Contact Recreation (swimming) Secondary Contact Recreation (boating) Fish and Wildlife Propagation (fishing) Outstanding Natural Resource
Mermentau River Basin	101	Primary Contact Recreation (swimming) Fish and Wildlife Propagation (fishing) Oyster Propagation
Mississippi River Basin	47	Primary Contact Recreation (swimming) Fish and Wildlife Propagation (fishing) Oyster Propagation Limited Aquatic Life and Wildlife
Ouachita River Basin	208	Primary Contact Recreation (swimming) Secondary Contact Recreation (boating) Fish and Wildlife Propagation (fishing) Outstanding Natural Resource Drinking Water Supply Limited Aquatic Life and Wildlife
Pearl River Basin	93	Fish and Wildlife Propagation (fishing) Outstanding Natural Resource

Basin Name	Number of Impaired Subsegments	Impaired Designated Uses
Red River Basin	202	Primary Contact Recreation (swimming) Secondary Contact Recreation (boating) Fish and Wildlife Propagation (fishing) Outstanding Natural Resource Drinking Water Supply
Terrebonne Basin	173	Primary Contact Recreation (swimming) Secondary Contact Recreation (boating) Fish and Wildlife Propagation (fishing) Outstanding Natural Resource Oyster Propagation
Vermilion-Tech Basin	174	Primary Contact Recreation (swimming) Secondary Contact Recreation (boating) Fish and Wildlife Propagation (fishing) Oyster Propagation

Source: LDEQ (2016)

4.2.1.2.2 Wetlands and Floodplains

Executive Order (EO) 11990: Protection of Wetlands is intended to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. To meet these objectives, the EO requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided.

Louisiana has more than 3 million acres of coastal wetlands that constitute approximately 40% of the remaining coastal marsh in the lower 48 states (USGS 2014). Louisiana’s coastal zone can be divided into two distinct regions: the Chenier Plain, extending west from Vermilion Bay to Texas; and the Deltaic Plain, which extends from Vermilion Bay east to the Pearl River Basin on the Mississippi state line. Both regions were formed by historic patterns of sedimentation and erosion from the Mississippi River and its tributaries along with influences from the Gulf of Mexico. Over the past several thousand years, these fluvio-deltaic processes created more than 4 million acres of coastal wetlands and gave rise to one of the most productive ecosystems in the United States.

The state’s palustrine wetlands include swamps and marshes. Swamps are forested areas that are flooded by fresh water with low salinity levels. In Louisiana, bald cypress-tupelo swamps are most common and are co-dominated by bald cypress (*Taxodium distichum* var. *distichum*) and water tupelo (*Nyssa aquatica*). Marshes are areas with standing water for at least part of the year that are composed of non-woody standing vegetation, including grasses and sedges (America’s Wetland Resource Center 2018).

Freshwater marshes have a salinity range of 0 to 2 ppt with very high plant species diversity. Typical plants include maidencane (*Panicum hemitomon*), bull tongue (*Sagittaria lancifolia*), spikerush (*Eleocharis*), cattail (*Typha*), water lilies (*Nymphaea*, *Nymphoides*, and *Nuphar*), and sedge (*Scirpus*) (America’s Wetland Resource Center 2018). A unique form of freshwater marsh is the fresh floatant marsh system. It is composed of masses of intertwined living plant roots forming a relatively thick mat that is suspended above the water table (NPS 2015).

Intermediate marshes have a salinity range of 2 to 10 ppt with high plant species diversity. Intermediate marshes exhibit a mix of freshwater and brackish marsh plant species, having an abundance of wiregrass (*Spartina patens*) and a mixture of such plants as roseau cane (*Phragmites australis*), bull tongue, alligator weed (*Alternanthera philoxeroides*), cattail, water lilies, and sedge. Brackish marshes have a salinity of 10 to 20 ppt with moderate plant species diversity. The characteristic plant is wiregrass, which typically represents more than 50% of the total vegetation (America’s Wetland Resource Center 2018).

Estuarine wetlands are tidally influenced bodies of water and their adjacent wetlands that are semi-enclosed by land but are at least periodically open to the sea at one end and have fresh water flowing into the other. These wetlands are subject to salinity fluctuations depending on the amount of fresh water received from adjacent river(s) and the amount of seawater from the adjacent sea. Saline (salt) marshes have a salinity greater than 20 ppt with low plant species diversity. The characteristic plant in estuarine wetlands is oyster grass (*Spartina alterniflora*). Salt grass (*Distichlis spicata*), black rush (*Juncus roemerianus*), and wiregrass may also be abundant, as are pickleweed (*Salicornia* sp.) and Batis (*Batis maritima*) (America's Wetland Resource Center 2018).

Lacustrine wetlands are composed of lakes and ponds characterized by sparse vegetation. Riverine wetlands are composed of rivers, streams, and bayous. When plants are present, they are often rooted in the bottom (water lilies, algae) and are most abundant in eddies along the margins.

Marine wetlands are located in the open sea over the continental shelf and are subject to waves, currents, and tides. Salinity is typically greater than 30 ppt and vegetation includes algae and phytoplankton (America's Wetland Resource Center 2018).

Wetland types potentially affected by the alternative are summarized by parish and by NWI category in Table A-4 of Appendix A.

EO 11988: Floodplain Management requires federal agencies to avoid, to the extent possible, the adverse, long- and short-term impacts associated with the occupancy and modification of floodplains and avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Most of the nutrient reduction alternatives would occur adjacent to or close to rivers or wetland areas and may also be located in floodplains. In many cases, alternatives may be subject to flooding or inundation, with additional hazards from storm-induced wave action. Given the nature of most of the recreational use alternatives, which are related to enhancing shoreline use and boating recreation opportunities, most of the alternatives are located in floodplains.

4.2.1.3 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

The Clean Air Act (CAA) and its amendments require EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The act also allows states to adopt additional ambient air quality standards.

EPA defines ambient air in 40 CFR 50.1(e) as “that portion of the atmosphere, external to buildings, to which the general public has access.” In compliance with the 1970 CAA and the 1977 and 1990 CAA amendments, EPA promulgated NAAQS. The NAAQS include primary standards that set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. To date, EPA has issued NAAQS for seven criteria pollutants: ozone, particles with a diameter less than or equal to a nominal 2.5 micrometers (PM_{2.5}), particles with a diameter less than or equal to a nominal 10 micrometers (PM₁₀), sulfur dioxide, lead, carbon monoxide, and nitrogen dioxide (Table 4.2-3).

The State of Louisiana has established Ambient Air Quality Standards in Louisiana Administrative Code, Title 33, Part III, Chapter 7, for the same criteria pollutants set by EPA (Table 4.2-3). All affected parishes are considered in attainment for the NAAQS and the state Ambient Air Quality Standards, except for St. Bernard Parish, which is in non-attainment for sulfur dioxide (LDEQ 2018). Additional information about air quality status, by parish, is provided in Appendix A, Table A-5.

Table 4.2-3. National and State Ambient Air Quality Standards

Pollutant	Averaging Time	Louisiana Standards, Primary	Louisiana Standards, Secondary	National Standards, Primary	National Standards, Secondary
Ozone	8-hour	0.08 ppm	Same as primary	0.070 ppm	Same as primary
Carbon monoxide	8-hour	9 ppm	Same as primary	9 ppm	–
	1-hour	35 ppm	Same as primary	35 ppm	–
Nitrogen dioxide	Annual	50 ppb	Same as primary	53 ppb	Same as primary
	1-hour	–	–	100 ppb	–
Sulfur dioxide	Annual	0.03 ppm	–	–	–
	24-hour	0.14 ppm	–	–	–
	3-hour	–	1,300 µg/m ³	–	0.5 ppm
	1-hour	–	–	75 ppb	–
PM ₁₀	24-hour	150 µg/m ³	Same as primary	150 µg/m ³	Same as primary
PM _{2.5}	Annual (arithmetic mean)	15 µg/m ³	Same as primary	12 µg/m ³	15 µg/m ³
	24-hour	35 µg/m ³	Same as primary	35 µg/m ³	Same as primary
Lead	Rolling 3-month average	1.5 µg/m ³	Same as primary	0.15 µg/m ³	Same as primary

Notes:

Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Averaging Time: the amount of time that the associated data are averaged to assess compliance with the standard (LDEQ 2018).

µg/m³ = micrograms per cubic meter; ppm = parts per million; ppb = parts per billion

Greenhouse gases (GHGs) are chemical compounds found in the Earth’s atmosphere that absorb and trap infrared radiation as heat. The principal GHGs emitted into the atmosphere through human activities are carbon dioxide, methane, nitrous oxide, and fluorinated gases, which are described in more detail below (EPA 2018b).

- Carbon dioxide enters the atmosphere through burning fossil fuels (coal, natural gas, and oil), solid waste, trees and wood products, and also as a result of certain chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (or “sequestered”) when it is absorbed by plants as part of the biological carbon cycle.
- Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. Hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes.
- Fluorinated gases are sometimes used as substitutes for stratospheric ozone-depleting substances (e.g., chlorofluorocarbons, hydrochlorofluorocarbons, and halons).

4.2.2 Biological Environment

4.2.2.1 TERRESTRIAL, COASTAL-NEARSHORE, AND MARINE HABITATS

The habitats of southern Louisiana were largely formed by the Mississippi River, where sediment deposition created coastal land where ocean once existed, and was reworked through natural meandering and flooding of river systems. The ancient Mississippi River created large delta lobes where it reached the Gulf of Mexico, and as the location of the main channel changed over time, it formed overlapping deltas with remnant channels. Currently, this area consists of a series of interconnected streams with complex flows, which are separated by former and present natural and constructed levees. The Mississippi River and its distributaries supply fresh water to the Gulf, creating a mosaic of ecosystems that include swamps, marshes, bottomland hardwood forests, uplands, savannahs, and beaches (USGS 2017).

Several level IV ecoregions are present within the affected parishes (Table 4.2-4). Each of these ecoregions supports a different array of plant and animal species. Ecoregions in which alternatives are located are described in Appendix A.

Table 4.2-4. Ecoregions of Louisiana within the Affected Parishes

Ecoregion	Parishes	Alternatives
Terrestrial		
Arkansas/Ouachita River Holocene Meander Belts	Catahoula	Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes
Arkansas/Ouachita River Backswamps	Catahoula	Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes
Flatwoods	Jefferson Davis	Sam Houston Jones State Park Improvements Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes
Floodplains and Low Terraces	Acadia, Jefferson Davis, St. Tammany, Vermilion, Washington	Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes Nutrient Reduction and Management on Cropland and Grazing Lands in Iberia, St. Mary, and Vermilion Parishes
Gulf Coast Flatwoods	St. Helena, St. Tammany, Tangipahoa	None
Inland Swamps	Iberia, Jefferson, Lafourche, St. Charles, St. Mary, St. Martin, St. Tammany, Tangipahoa, Terrebonne	Improvements to Grand Avoille Boat Launch Nutrient Reduction on Cropland and Grazing Lands in Bayou Folse Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes Nutrient Reduction and Management on Cropland and Grazing Lands in Iberia, St. Mary, and Vermilion Parishes
Lafayette Loess Plains	Acadia, Iberia, Lafayette, St. Martin, St. Mary, Vermilion	Palmetto Island State Park Improvements Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes Nutrient Reduction and Management on Cropland and Grazing Lands in Iberia, St. Mary, and Vermilion Parishes

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Ecoregion	Parishes	Alternatives
Macon Ridge	Catahoula	Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes Nutrient Reduction on Cropland and Grazing Lands in Concordia, Catahoula, and Tensas Parishes
Northern Backswamps	Tensas	Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes Nutrient Reduction on Cropland and Grazing Lands in Concordia, Catahoula, and Tensas Parishes
Northern Holocene Meander Belts	Catahoula, Tensas	Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes Nutrient Reduction on Cropland and Grazing Lands in Concordia, Catahoula, and Tensas Parishes
Northern Humid Coastal Marshes	Cameron, Jefferson Davis	None
Northern Humid Gulf Coastal Prairies	Acadia, Lafayette, Vermilion	Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes Nutrient Reduction and Management on Cropland and Grazing Lands in Iberia, St. Mary, and Vermilion Parishes
Southeastern Floodplains and Low Terraces	St. Tammany, Washington	Nutrient Reduction on Dairy Farms in Washington Parish
Southern Backswamps	Catahoula, Concordia, Lafayette, St. Martin	Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes Nutrient Reduction on Cropland and Grazing Lands in Concordia, Catahoula, and Tensas Parishes
Southern Holocene Meander Belts	Catahoula, Concordia, Iberia, Jefferson, Lafayette, Lafourche, Orleans, Plaquemines, St. Bernard, St. Charles, St. Martin, St. Mary, Tensas, Terrebonne	Chitimacha Boat Launch Louisiana Swamp Exhibit at Audubon Zoo Louisiana Wetlands Gallery at Audubon Aquarium Pointe-aux-Chenes Wildlife Management Area Recreational Use Enhancement St. Bernard State Park Improvements Nutrient Reduction on Cropland and Grazing Lands in Bayou Folse Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes Nutrient Reduction and Management on Cropland and Grazing Lands in Iberia, St. Mary, and Vermilion Parishes Nutrient Reduction on Cropland and Grazing Lands in Concordia, Catahoula, and Tensas Parishes
Southern Pleistocene Valley Trains	Catahoula	Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes Nutrient Reduction on Cropland and Grazing Lands in Concordia, Catahoula, and Tensas Parishes
Southern Pine Plains and Hills	St. Helena, St. Tammany, Tangipahoa, Washington	Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes Nutrient Reduction on Dairy Farms in Washington Parish
Southern Rolling Plains	St. Helena	None
Southern Tertiary Uplands	Catahoula	Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes Nutrient Reduction on Cropland and Grazing Lands in Concordia, Catahoula, and Tensas Parishes

Ecoregion	Parishes	Alternatives
Coastal/Nearshore		
Deltaic Coastal Marshes and Barrier Islands	Iberia, Jefferson, Lafourche, Orleans, Plaquemines, St. Bernard, St. Charles, St. Mary, St. Tammany, Tangipahoa, Terrebonne, Vermilion	Atchafalaya Delta Wildlife Management Area Access Atchafalaya Delta Wildlife Management Area Campgrounds Recreational Use Improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit Bayou Segnette State Park Improvements Belle Chasse Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin Cypremort Point State Park Improvements Des Allemands Boat Launch Grand Isle State Park Improvements Pass-a-Loutre Wildlife Management Area Campgrounds Pass-a-Loutre Wildlife Management Area Crevasse Access The Wetlands Center WHARF Phase 1 Nutrient Reduction on Cropland and Grazing Land in Bayou Folse Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes Nutrient Reduction and Management on Cropland and Grazing Lands in Iberia, St. Mary, and Vermilion Parishes
Gulf Barrier Islands and Coastal Marshes	St. Tammany	Middle Pearl
Texas-Louisiana Coastal Marshes	Cameron, Jefferson Davis, Vermilion	Rockefeller Piers and Rockefeller Signage Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes Nutrient Reduction and Management on Cropland and Grazing Lands in Iberia, St. Mary, and Vermilion Parishes
Marine		
Northern Gulf of Mexico*	Cameron, Iberia, Jefferson, Lafourche, Plaquemines, St. Bernard, St. Mary, Terrebonne	Grand Isle State Park Improvements Pass-a-Loutre Wildlife Management Area Crevasse Access

*The alternatives identified as occurring within the Northern Gulf of Mexico marine ecoregion are also present in the Deltaic Coastal Marshes and Barrier Islands ecoregion, and because of the largely land-based nature of the alternatives, they are discussed with the coastal/nearshore ecoregion.

4.2.2.2 PROTECTED SPECIES

Protected species include wildlife and plant species that are protected from harm or harassment by law. The Endangered Species Act of 1973 (ESA) protects all federally listed wildlife and plant species, and designated critical habitat of these species, in the United States. The ESA requires that federal agencies ensure that any action authorized, funded, or carried out by an agency is not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of designated critical habitat. Other protected species include marine mammals, such as the common bottlenose dolphin (*Tursiops truncatus*), protected by the Marine Mammal Protection Act of 1972 (MMPA), and migratory birds, protected by the Migratory Bird Treaty Act of 1908 (MBTA; discussed below). The primary regulatory agencies responsible for ESA compliance are USFWS and the National Marine Fisheries Service (NMFS).

4.2.2.2.1 Listed Species

A list of species listed as threatened or endangered within the 23 parishes in which the alternatives occur is included in Table 4.2-5. This list was developed using the USFWS Information for Planning and Consultation resource list for the 23 parishes.

Table 4.2-5. Federally Protected species, under the Endangered Species Act and Marine Mammal Protection Act, that are likely to occur in the Parishes in Which the Reasonable Range of Alternatives Occur

Common Name	Scientific Name	Federal Status*	Parishes	Habitat Description†
Birds				
Piping plover	<i>Charadrius melodus</i>	T	Cameron, Jefferson, Lafourche, Plaquemines, St. Bernard, St. Mary, Terrebonne, Vermilion	In Louisiana, winters on intertidal beaches with sand and/or mud flats with no or very sparse vegetation.
Red knot	<i>Calidris canutus rufa</i>	T	Cameron, Iberia, Jefferson, Lafourche, Plaquemines, St. Bernard, St. Mary, Terrebonne, Vermilion	Winters on barrier island systems in southeastern Louisiana.
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Calcasieu, Catahoula, St. Tammany, Tangipahoa	Mature pine forests. Prefers longleaf pines (<i>Pinus palustris</i>), but other species of southern pine are also used.
Interior Least tern	<i>Sterna antillarum athalossos</i>	E	Concordia, Tensas	Nesting habitat includes barren to sparsely vegetated sandbars along rivers, sand and gravel pits, lake and reservoir shorelines, and occasionally gravel rooftops.
Fish				
Atlantic sturgeon (Gulf subspecies)	<i>Acipenser oxyrinchus (=oxyrinchus) desotoi</i>	E	Cameron, Iberia, Jefferson, Lafourche, Orleans, Plaquemines, St. Bernard, St. Charles, St. Helena, St. Mary, St. Tammany, Tangipahoa, Terrebonne, Vermilion, Washington	All saltwater habitats. Found in major rivers that empty into the Gulf of Mexico during spawning season (such as the Pearl River Basin and Lake Pontchartrain Basin).
Pallid sturgeon	<i>Scaphirhynchus albus</i>	E	Catahoula, Concordia, Iberia, Jefferson, Orleans, Plaquemines, St. Bernard, St. Charles, St. Martin, St. Mary, Tensas	Prefers main channels of excessively turbid rivers in areas with strong currents over firm sandy bottoms. Found in the Atchafalaya River Basin, Mississippi River Basin, and Lake Pontchartrain Basin.
Mammals				
West Indian manatee	<i>Trichechus manatus</i>	T	Cameron, Iberia, Jefferson, Lafourche, Orleans, Plaquemines, St. Bernard, St. Charles, St. Mary, St. Tammany, Tangipahoa, Terrebonne, Vermilion	Found in fresh- and salt-water habitat of canals, creeks, lagoons, or rivers, in areas with access to natural springs or warm water (in winter), and to areas with vascular plants and freshwater sources.
Fin whale	<i>Balaenoptera physalus</i>	E	Marine, offshore waters	Found in deep, offshore waters of all major oceans, primarily in temperate to polar latitudes, and less commonly in the tropics. Usually occur year-round in a wide range of latitudes and longitudes, but the density of individuals in any one area changes seasonally.

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Common Name	Scientific Name	Federal Status*	Parishes	Habitat Description†
Sei whale	<i>Balaenoptera borealis</i>	E	Marine, offshore waters	Prefers subtropical to subpolar waters on the continental shelf edge and slope worldwide. Usually observed in deeper waters of oceanic areas far from the coastline.
Sperm whale	<i>Physeter macrocephalus</i>	E	Marine, offshore waters	Found in areas with a water depth of 1968 feet (600 m) or more, and are uncommon in waters less than 984 feet (300 m) deep.
Reptiles				
Gopher tortoise (west of the Mobile and Tombigbee Rivers)	<i>Gopherus polyphemus</i>	T	St. Tammany, Tangipahoa, Washington	Found in upland longleaf pine and/or mixed pine-hardwood forests, in areas with very sandy and well-drained soils.
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	E	Cameron, Iberia, Jefferson, Lafourche, Plaquemines, St. Bernard, St. Mary, Terrebonne, Vermilion	Found in warm bays and shallow portions of oceans, such as seagrass beds and estuaries. Nesting occurs on mainland beaches and islands.
Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>	E	Cameron, Iberia, Jefferson, Lafourche, Plaquemines, St. Bernard, St. Mary, Terrebonne, Vermilion	Found in warm bays and coastal waters, such as seagrass beds, tidal rivers, and estuaries. Nesting occurs on mainland sandy coastal beaches.
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E	Cameron, Iberia, Jefferson, Lafourche, Plaquemines, St. Bernard, St. Mary, Terrebonne, Vermilion	Found in open ocean and deeper waters of the Gulf and coastal bays. Nesting occurs on coastal beaches and barrier islands.
Loggerhead sea turtle (Northwest Atlantic Ocean DPS)	<i>Caretta caretta</i>	T	Cameron, Iberia, Jefferson, Lafourche, Plaquemines, St. Bernard, St. Mary, Terrebonne, Vermilion	At different life stages this species can be found in coastal waters, including estuaries, and deep ocean. Nesting occurs primarily on ocean beaches and occasionally on estuarine beaches with coarse-grained sands.
Ringed map turtle	<i>Graptemys oculifera</i>	T	St. Tammany, Washington	Endemic to the Pearl and Bogue Chitto rivers of southeastern Louisiana and western Mississippi, prefers streams with moderate to fast current, numerous basking logs with sun exposure, and nearby sand and gravel bars.
Ferns and allies				
Louisiana quillwort	<i>Isoetes louisianensis</i>	E	St. Tammany, Washington	Found in small blackwater streams, on bars and banks with coarse and stable substrate, in small stream forests.
Clams				
Fat pocketbook	<i>Potamilus capax</i>	E	Concordia, Tensas	Found in the Lower Mississippi River, in sand in secondary channel habitats, and in sand/silt/mud in side channels.
Alabama (=inflated) heelsplitter	<i>Potamilus inflatus</i>	T	St. Helena, St. Tammany	Found in the Pearl River Basin and the Lake Pontchartrain Basin, prefers flowing rivers with stable sand or silt bottoms.

* USFWS Status Definitions

E = Endangered. Endangered species are those in imminent jeopardy of extinction. The ESA specifically prohibits the take of a species listed as endangered. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct.

T = Threatened. Threatened species are those in imminent jeopardy of becoming endangered. The ESA prohibits the take of a species listed as threatened under Section 4d of the ESA. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct.

† Range or habitat information is from USFWS Louisiana Ecological Services Field Office or LDWF

4.2.2.2 Critical Habitat

Critical habitat is defined as areas containing the physical or biological features essential to a listed species' conservation, and is designated when it is both "prudent and determinable." These features are referred to as primary constituent elements (PCEs). Any action authorized, funded, or carried out by an agency is prohibited from destroying or adversely modifying designated critical habitat. Designated critical habitat for three species occurs within the parishes where alternatives are located (piping plover [*Charadrius melodus*] and Gulf sturgeon [*Acipenser oxyrinchus desotoi*]), although one of the species is not currently known to be present in the state of Louisiana (dusky gopher frog [*Rana sevosia*]). Critical habitat for the dusky gopher frog was designated in 2012 (USFWS 2012), and in Louisiana consists of approximately 1,544 acres in St. Tammany Parish. This area of Louisiana is part of the historic range of the species, and would aid in the conservation of the species. Additional critical habitat was also designated in Mississippi, where the current known range of the species is limited to three ponds (USFWS 2015). None of the alternatives would occur near designated critical habitat for the dusky gopher frog, and therefore the species is not discussed further.

Critical habitat for the Gulf sturgeon was designated in 2003 (USFWS 2003), and is restricted to the eastern half of Lake Pontchartrain and the entirety of Lake Borgne, located in the eastern portion of the analysis area (Figure 4.2-2). This critical habitat (Unit 8) contains habitat identified as estuarine and marine habitat of the species, and provides juvenile, subadult, and adult feeding, resting, and passage habitat from the Pascagoula and the Pearl River subpopulations. Lake Pontchartrain is thought to provide important wintering habitat for juveniles and subadults (USFWS 2003). None of the alternatives would occur in designated critical habitat for this species. Critical habitat for winter populations of piping plover in Louisiana was designated in 2001, and consists of "coastal areas that support intertidal beaches and flats (between annual low tide and annual high tide) and associated dune systems and flats above annual high tide" (USFWS 2001). All seven critical habitat units in Louisiana occur in the analysis area and contain approximately 62,454 acres of federal, state, and privately owned lands (USFWS 2001). There are alternatives that would occur in designated critical habitat for this species (see Figure 4.2-2).

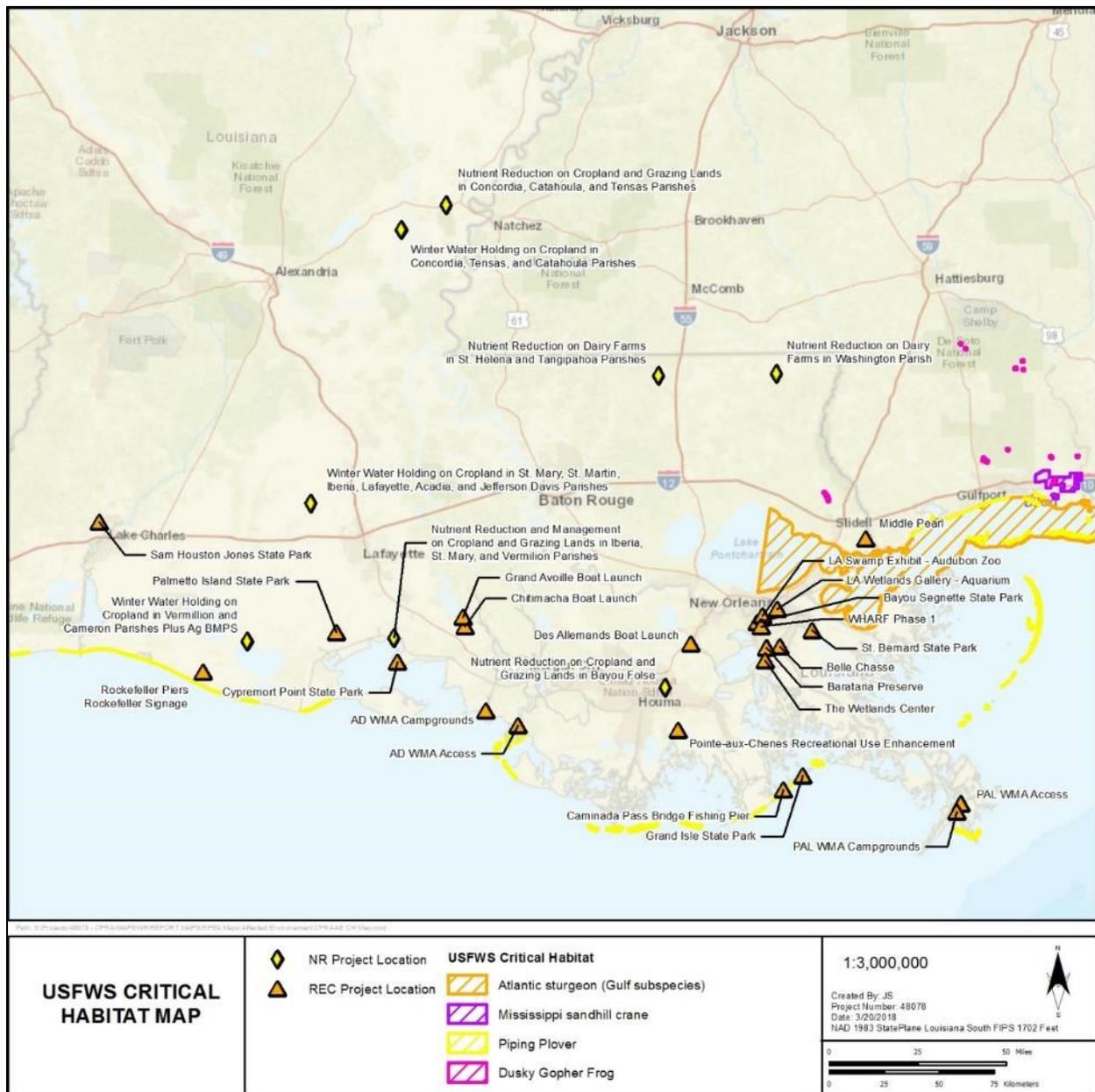


Figure 4.2-2. Location of designated critical habitat near the alternatives.

4.2.2.3 TERRESTRIAL WILDLIFE, INCLUDING MIGRATORY BIRDS

The analysis area contains habitat for a number of terrestrial species, and is characterized by the upland plains, swamplands, bayous, forested bottomlands, coastal marshlands, beaches, and barrier islands of the region. Various species of mammals, birds (discussed below), amphibians, and reptiles can be found across these diverse habitats, and common species include North American river otter (*Lontra canadensis*), white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), squirrel (*Sciurus* spp.), cottontail rabbit (*Sylvilagus* spp.), American alligator (*Alligator mississippiensis*), as well as numerous species of frogs, turtles, and snakes. Non-native wildlife in the analysis area include nutria (*Myocastor coypus*) and wild boar (*Sus scrofa*).

Migratory birds include neotropical (long-distance) and temperate (short-distance) migrants, as well as resident species. The diverse habitat in the analysis area provides suitable breeding, nesting, feeding, foraging, resting, and/or roosting habitat for a number of migratory bird species groups. These groups include wading birds (e.g., egrets and herons), shorebirds (e.g., sandpipers and plovers), seabirds (e.g., gulls and terns), marsh birds (e.g., rails and coots), waterfowl (e.g., ducks and geese), and land birds, which include raptors (e.g., eagles, hawks, falcons, and owls), and numerous passerines (e.g., sparrows, warblers, flycatchers, jays, and wrens). The analysis area supports a high diversity of birds during breeding, winter, and migration as a result of the varied habitats.

The MBTA is the primary legislation in the United States protecting migratory birds. The statute makes it unlawful without a waiver to pursue, hunt, take, capture, kill, or sell birds or the parts, nests, or eggs of migratory birds. Non-native bird species, such as European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*), are not covered under the MBTA. Another statute, the Bald and Golden Eagle Protection Act of 1940 (BGEPA), further protects eagles within the United States. In addition to similar protections afforded migratory birds, the BGEPA also protects eagles from disturbance and human-induced alterations that may impact nesting areas. Bald eagles (*Haliaeetus leucocephalus*) are known to breed and winter in the analysis area.

4.2.2.4 MARINE AND ESTUARINE FAUNA

Marine and estuarine aquatic fauna and fishery resources are important because of the Fish and Wildlife Coordination Act of 1958, as amended; the ESA; the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended (Magnuson-Stevens Act); the Magnuson-Stevens Act Reauthorization of 2006; the Coastal Zone Management Act; and the Estuary Protection Act. Marine and estuarine aquatic fauna and fishery resources are important because of the following:

- They are critical elements of many valuable estuarine and marine habitats.
- They are indicators of the health of various estuarine and marine habitats.
- Many species are commercially and recreationally important.

Many of the alternatives are located within tidally influenced areas and support a wide variety of living aquatic resources including resident and migratory fishes, mammals, crustaceans, mollusks, reptiles and benthic invertebrates. Representative species may include: diamond-backed terrapin (*Malaclemys terrapin*), saltmarsh snake (*Nerodia clarkia*), Atlantic croaker (*Micropogonias undulatus*), Gulf killifish (*Fundulus grandis*), Gulf menhaden (*Brevoortia patronus*), striped mullet (*Mugil cephalus*), white shrimp (*Litopenaeus setiferus*), blue crab (*Callinectes sapidus*), eastern oyster (*Crassostrea virginica*), oyster drill (*Stramonita haemastoma*), and various polychaete worms. These estuarine-dependent species often serve as prey for other coastal and aquatic species, including sport fish in managed fisheries such as red drum (*Sciaenops ocellatus*), spotted seatrout (*Cynoscion nebulosus*), southern flounder (*Paralichthys lethostigma*), billfishes, snappers and sharks; avian predators such as the brown pelican (*Pelecanus occidentalis*); and mammalian predators like the American mink (*Mustela vison*) and river otter. Habitats in these regions typically include estuarine emergent wetlands (e.g., marsh edge, inner marsh, marsh ponds, and tidal creeks); SAV; seagrasses; mud, sand, shell, and rock substrates (e.g., oyster reefs and barrier island flats); mangrove wetlands; and estuarine water column. Marine and estuarine fauna occur in the following parishes: Cameron, Vermilion, Iberia, St. Mary, Terrebonne, Lafourche, Jefferson, Plaquemines, St. Bernard, Orleans, and St. Tammany.

4.2.2.4.1 Essential Fish Habitat

Fishery resources are publicly significant because of the high priority placed on their aesthetic, recreational, and commercial value. Habitat is the foundation for the commercial and recreational saltwater fishing industries that provided more than 1.6 million full- and part-time jobs and over \$200 billion in economic activity across the United States in 2015. The estuarine-dependent Louisiana fishery alone is an \$875 million industry (LA TIG 2017b). Aquatic fauna requires healthy surroundings to survive and reproduce. Essential fish habitat (EFH) includes all types of aquatic habitat—wetlands, coral reefs, seagrasses, and mangroves—where fish spawn, breed, feed, or grow to maturity.

The Magnuson-Stevens Act is the primary law governing marine fisheries management in federal waters of the U.S. and fosters long-term biological and economic sustainability of the nation’s marine fisheries out to 200 nautical miles. The key objectives of the act are to prevent overfishing, rebuild overfished stocks, increase long-term economic and social benefits, and ensure a safe and sustainable supply of seafood. The act provides a transparent and robust process of science, management, innovation, and collaboration with the fishing industry to evaluate and determine if a stock status is experiencing overfishing or is overfished (NOAA Fisheries 2018a).

EFH is defined in the Magnuson-Stevens Act as “those waters and substrates necessary for fish to spawn, breed, feed, or grow to maturity.” The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. Any federal agency that takes an action that could adversely affect EFH by reducing the quantity or quality of habitat must work with NMFS to identify impacts and steps for conserving the habitat and reducing the impact of the action (NOAA Fisheries 2018a). NMFS has identified EFH habitats for the Gulf of Mexico in its Fisheries Management Plan Amendments. These habitats include estuarine emergent wetlands; seagrass beds; algal flats; mud, sand, shell, and rock substrates; and the estuarine water column. There are 15 alternatives near EFH. The EFH components within the areas of these alternatives include emergent wetlands, mud substrate, and estuarine water columns. Table 4.2-6 provides a list of the species that NMFS manages under the federally Implemented fisheries management plans near 15 alternatives, which are listed in Table 4.2-7. The alternatives listed in Table 4.2-7 and shown in Figure 4.2-3 overlap with EFH for coastal migratory pelagic, red drum, reef fish, and shrimp.

Table 4.2-6. Species Managed by National Marine Fisheries Service with Essential Fish Habitat near the Alternatives

Common Name	Scientific Name
Coastal Migratory Pelagics	
King mackerel	<i>Scomberomorus cavalla</i>
Spanish mackerel	<i>Scomberomorus maculatus</i>
Cobia	<i>Rachycentron canadum</i>
Red Drum	
Red drum	<i>Sciaenops ocellatus</i>
Reef Fish	
Queen snapper	<i>Etelis oculatus</i>
Mutton snapper	<i>Lutjanus analis</i>
Blackfin snapper	<i>Lutjanus buccanella</i>
Red snapper	<i>Lutjanus campechanus</i>
Cubera snapper	<i>Lutjanus cyanopterus</i>

Common Name	Scientific Name
Gray (mangrove) snapper	<i>Lutjanus griseus</i>
Lane snapper	<i>Lutjanus synagris</i>
Silk snapper	<i>Lutjanus vivanus</i>
Yellowtail snapper	<i>Ocyurus chrysurus</i>
Wenchman	<i>Pristipomoides aquilonaris</i>
Vermilion snapper	<i>Rhomboplites aurorubens</i>
Speckled hind	<i>Epinephelus drummondhayi</i>
Yellowedge grouper	<i>Epinephelus flavolimbatus</i>
Goliath grouper	<i>Epinephelus itajara</i>
Red grouper	<i>Epinephelus morio</i>
Warsaw grouper	<i>Epinephelus nigritus</i>
Snowy grouper	<i>Epinephelus niveatus</i>
Nassau grouper	<i>Epinephelus striatus</i>
Black grouper	<i>Mycteroperca bonaci</i>
Yellowmouth grouper	<i>Mycteroperca interstitialis</i>
Gag	<i>Mycteroperca microlepis</i>
Yellowfin grouper	<i>Mycteroperca venenosa</i>
Scamp	<i>Mycteroperca phenax</i>
Goldface tilefish	<i>Caulolatilus chrysops</i>
Blueline tilefish	<i>Caulolatilus microps</i>
Tilefish	<i>Lopholatilus chamaeleonticeps</i>
Greater amberjack	<i>Seriola dumerili</i>
Lesser amberjack	<i>Seriola fasciata</i>
Almaco jack	<i>Seriola rivoliana</i>
Banded rudderfish	<i>Seriola zonata</i>
Gray triggerfish	<i>Balistes capriscus</i>
Hogfish	<i>Lachnolaimus maximus</i>
Shrimp	
Brown shrimp	<i>Farfantepenaeus aztecus</i>
White shrimp	<i>Litopenaeus setiferus</i>
Pink shrimp	<i>Farfantepenaeus duorarum</i>
Royal red shrimp	<i>Hymenopenaeus robustus</i>

Source: NOAA Fisheries (2018e)

Coastal Migratory Pelagic EFH: EFH for coastal migratory pelagic consists of Gulf of Mexico waters and substrates extending from the U.S./Mexico border to the boundary between the areas covered by the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council from estuarine waters out to depths of 100 fathoms.

Red Drum EFH: EFH for red drum consists of all Gulf of Mexico estuaries; waters and substrates extending from Vermilion Bay, Louisiana, to the eastern edge of Mobile Bay, Alabama, out to depths of 25 fathoms (1 fathom = 6 feet); waters and substrates extending from Crystal River, Florida, to Naples, Florida, between depths of 5 and 10 fathoms; waters and substrates extending from Cape Sable, Florida, to the boundary between the areas covered by the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council between depths of 5 and 10 fathoms.

Reef Fish EFH: EFH for reef fish consists of Gulf of Mexico waters and substrates extending from the U.S./Mexico border to the boundary between the areas covered by the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council from estuarine waters out to depths of 100 fathoms.

Shrimp EFH: EFH for shrimp consists of Gulf of Mexico waters and substrates extending from the U.S./Mexico border to Fort Walton Beach, Florida, from estuarine waters out to depths of 100 fathoms; waters and substrates extending from Grand Isle, Louisiana, to Pensacola Bay, Florida, between depths of 100 and 325 fathoms; waters and substrates extending from Pensacola Bay, Florida, to the boundary between the areas covered by the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council out to depths of 35 fathoms, with the exception of waters extending from Crystal River, Florida, to Naples, Florida, between depths of 10 and 25 fathoms and in Florida Bay between depths of 5 and 10 fathoms.

Table 4.2-7. Alternatives that Occur in Coastal Migratory Pelagic, Red Drum, Reef Fish, or Shrimp Essential Fish Habitat Designations

Atchafalaya Delta Wildlife Management Area Access	Middle Pearl
Atchafalaya Delta Wildlife Management Area Campgrounds	Pass-a-Loutre Wildlife Management Area Crevasse Access
Bayou Segnette State Park Improvements	Pass-a-Loutre Wildlife Management Area Campgrounds
Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin	Palmetto Island State Park Improvements
Cypremort Point State Park Improvements	St. Bernard State Park Improvements
Des Allemands Boat Launch	Nutrient Reduction on Cropland and Grazing Land in Bayou Folse
Grande Avoille Boat Launch	Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices
Grand Isle State Park Improvements	

The 2005 generic EFH fishery management plan amendment (Gulf of Mexico Fishery Management Council 2005) should be consulted for additional detailed information on habitats identified as EFH. The seasonal and year-round locations of designated EFH for the managed fisheries are available on the NMFS Habitat Conservation Division website (NOAA Fisheries 2018b), and both inshore and offshore species abundance maps are available online using the EFH View Tool (NOAA Fisheries 2018c).

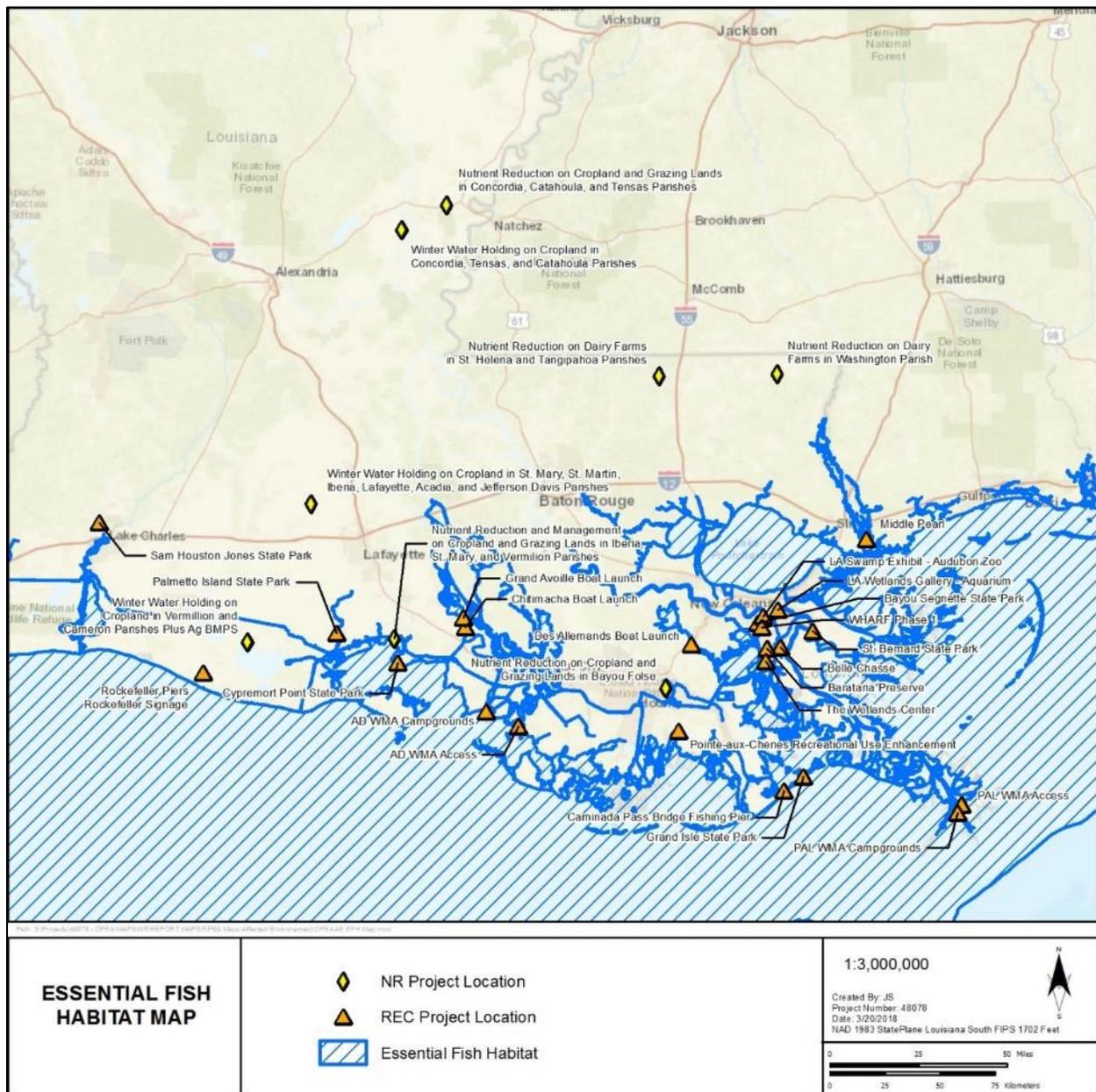


Figure 4.2-3. Designated essential fish habitat near the alternatives.

4.2.2.5 INVASIVE SPECIES

In Louisiana, as in most parts of the United States, invasive species are present and ground-disturbing activities such as construction can provide a pathway for invasive species to move into an area. In both aquatic and terrestrial environments, invasive species pose environmental threats, often displacing native species. Invasive aquatic species include lionfish (*Pterois*), orange cup coral (*Tubastraea coccinea*), Asian tiger shrimp (*Penaeus monodon*), and green mussel (*Perna canaliculus*). Invasive terrestrial species includes plants, such as Chinese tallow tree (*Triadica sebifera*) and cogon grass (*Imperata cylindrica*), as well as animals, such as nutria and wild boar (DWH Trustees 2016:Section 3.7.4). A comprehensive list

of invasive species in the State of Louisiana can be found in the *Louisiana Wildlife Action Plan* (Holcomb et al. 2015). For the purposes of this RP/EA, the most prevalent invasive species in Louisiana include those listed below (USGS 2015).

4.2.2.5.1 Invasive Animals

Asian carp: Four Asian carp species are now established in the United States, common carp (*Cyprinus carpio*), grass carp (*Ctenopharyngodon idella*), bighead carp (*Hypophthalmichthys nobilis*), and silver carp (*Hypophthalmichthys molitrix*). After introduction, they spread quickly, became abundant, and hurt native fishes either by damaging habitats or by consuming vast amounts of food.

Wild boar, feral hog: Wild boar are a problem across the Southeastern and Western United States. They can have a significant impact on ground-nesting birds, impact various plant species, increase soil erosion, and can change entire ecological systems.

Island applesnail (*Pomacea insularum*): Exotic applesnails significantly impact wetland plant communities and rice agriculture due to their voracious grazing. They are also a potential vector for disease transmission to humans and animals.

Nutria: The invasive nutria, or coypu, causes problems in coastal marshes and bald cypress swamps, especially in Louisiana. Nutria feed on the tender roots of plants, seedlings, and saplings, completely stripping vegetation in areas where they are concentrated.

4.2.2.5.2 Invasive Plants

Chinese tallow tree: The Chinese tallow tree, one of the greatest threats to habitat in the South, rapidly replaces native plants and trees, radically altering marsh, forest, and coastal prairie ecosystems.

Common water hyacinth: When not controlled, water hyacinth (*Eichhornia crassipes*) will cover lakes and ponds entirely; this dramatically affects water flow and blocks sunlight from reaching native aquatic plants, often resulting in mortality.

Giant salvinia: One of the most problematic aquatic plants, giant salvinia (*Salvinia molesta*) damages aquatic ecosystems by outgrowing and replacing native plants that provide habitat and food for native animals and waterfowl. Additionally, this plant blocks out sunlight and decreases oxygen, which can be detrimental to fish and other aquatic animals.

4.2.3 Socioeconomic Environment

This section discusses existing community characteristics that are relevant for evaluating the alternatives. These community characteristics consist of demographics (including populations protected by environmental justice), employment, income/poverty status, and industry trends within the socioeconomic analysis area. These local data are compared to information for the state of Louisiana for context. Information in this section was obtained from the U.S. Census Bureau 2012–2016 American Community Survey 5-year Estimates (U.S. Census 2018).

4.2.3.1 SOCIOECONOMIC RESOURCES AND ENVIRONMENTAL JUSTICE

The analysis area for socioeconomic resources are the 23 parishes in which the 31 alternatives would occur. The analysis area for socioeconomic resources and environmental justice extends beyond the immediate boundaries of the alternatives because the above-identified community characteristics that

could be effected by the alternatives are not limited to the footprints of each alternative. For example, a recreation area may affect a parish’s overall employment level by attracting new recreation users and increasing the demand for recreation supplies such as hunting and fishing supplies and guides.

4.2.3.1.1 Demographic Characteristics

From the historic downtown of New Orleans to the sparsely populated bayous that surround Atchafalaya Bay, the parishes that comprise the socioeconomic analysis area have very different populations and demographic characteristics. For example, Orleans Parish, where the city of New Orleans is partially located, has a population of 382,922 people of which 69.4% is a minority population. In contrast, Cameron Parish, a geographically large and predominantly rural parish in southwest Louisiana, has a population of 6,739 people of which 7.3% is a minority population.

Income, unemployment, and poverty levels also vary between parishes, but the differences are not as clearly indicative of a parish’s urban or rural setting. As can be anticipated, parishes that have higher levels of unemployment generally have a higher percentage of the population living below poverty level and a lower per capita income. Of the 23 parishes in the analysis area, 11 parishes have populations with higher unemployment and poverty levels and lower per capita income, when compared to the state average.

The demographic and economic characteristics of each parish and the State of Louisiana is shown in Table 4.2-8.

Table 4.2-8. Demographic and Economic Characteristics

Area	Population	Percent Minority Population*	Percent Population below Poverty Level	Percent Unemployed	Per Capita Income
Louisiana	4,645,670	40.7%	19.7%	4.6%	\$25,515
Parishes					
Acadia	62,372	22.3%	20.6%	9.1%	\$20,887
Calcasieu	197,233	31.5%	17.2%	7.4%	\$25,249
Cameron	6,739	7.3%	8.9%	3.5%	\$31,007
Catahoula	10,145	33.9%	20.5%	7.3%	\$21,870
Concordia	20,288	43.1%	31.9%	9.7%	\$17,110
Iberia	73,799	40.4%	19.9%	11.2%	\$23,737
Jefferson	435,204	45.9%	16.1%	6.4%	\$28,067
Jefferson Davis	31,399	21.4%	19.6%	8.5%	\$22,665
Lafayette	234,963	33.5%	16.5%	5.1%	\$30,403
Lafourche	97,688	22.8%	15.4%	7.3%	\$25,299
Orleans	382,922	69.4%	26.2%	9.8%	\$28,444
Plaquemines	23,584	33.7%	17.2%	3.9%	\$25,359
St. Bernard	44,091	35.6%	20.1%	11.1%	\$19,990
St. Charles	52,708	34.3%	12.6%	8.2%	\$28,146
St. Helena	10,714	55.5%	27.6%	14.3%	\$19,134
St. Martin	53,385	35.2%	17.3%	7.0%	\$23,597
St. Mary	53,053	43.6%	21.6%	10.9%	\$21,989

Area	Population	Percent Minority Population*	Percent Population below Poverty Level	Percent Unemployed	Per Capita Income
St. Tammany	246,269	20.5%	11.1%	7.3%	\$31,792
Tangipahoa	127,115	36.2%	22.3%	9.8%	\$22,544
Tensas	4,793	57.8%	33.8%	15.0%	\$16,171
Terrebonne	113,099	32.4%	20.2%	5.3%	\$24,069
Vermilion	59,524	21.3%	17.3%	8.2%	\$23,521
Washington	46,367	34.1%	26.4%	13.1%	\$17,957

Source: U.S. Census Bureau (2018)

*Percent minority population: 100% white only population, not Hispanic or Latino

Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, signed in 1994 by President Clinton, requires that federal agencies advance environmental justice by pursuing fair treatment and meaningful involvement of minority and low-income populations. Fair treatment means such groups should not bear a disproportionately high share of negative environmental consequences from federal programs, policies, decisions, or operations. Meaningful involvement means that federal officials actively promote opportunities for public participation and that federal decisions can be materially affected by participating groups and individuals.

As shown in Table 4.2-8 above, minority and low-income populations are present within the analysis area and, in some cases, individuals may fall into both categories. Therefore, an analysis of potential impacts to populations protected by environmental justice is provided for each of the alternatives in Section 4.5 and 4.6 to determine whether disproportionate adverse impacts would result from their implementation.

4.2.3.2 TOURISM AND RECREATIONAL USE, INCLUDING RECREATIONAL FISHING AND HUNTING

Louisiana’s unique history, culture, and environment provide for a rich diversity of recreational opportunities for both residents and domestic and international tourists. According to the University of New Orleans (2016) *Louisiana Tourism Forecast 2016–2019*, a record total of 28.9 million people visited the state in 2016. In 2015, an estimated \$844 million of state tax revenue was generated from \$11.5 billion of visitor spending. Of the 2015 visitor spending, \$7.1 billion was spent in New Orleans and \$4.4 billion was spent throughout the rest of the state. Although overall tourism in Louisiana has increased over the past few years, the report indicates that visitation to state parks has decreased or lagged behind other tourism indicators such as recreation employment, hotel vacancy rates, and airport use.

All of the recreational use alternatives would be located in parishes in coastal Louisiana, which offers unique water-based recreation activities including fishing, hunting, boating, and nature/wildlife viewing. These activities are an important component of coastal Louisiana’s recreational and economic setting. According to the U.S. Census Bureau 2016 data, the industry category, “Agriculture, forestry, fishing and hunting, and mining,” is one of the top four employers for 11 of the 23 parishes in the socioeconomic resource analysis area (The Data Center 2018). The industry category, “Arts, entertainment, recreation, and accommodation and food services,” is one of the top four employers in 10 of the parishes as well as the State of Louisiana. Table 4.2-9 identifies the percentage of the employed population that are employed in each of these industry categories for each parish in the socioeconomic resource analysis area. Gray-shaded cells indicate that the industry category is one of the top four industries contributing to the parish’s employment level.

Table 4.2-9. Percent Employed by Industry Category

Area	Percent Agriculture, Forestry, Fishing and Hunting, and Mining	Percent Arts, Entertainment, and Recreation, and Accommodation, and Food Services
Louisiana	4.6%	10.5%
Parishes		
Acadia	14.3%	7.3%
Calcasieu	2.8%	13.8%
Cameron	11.7%	5.9%
Catahoula	19.5%	3.6%
Concordia	11.2%	3.2%
Iberia	15.0%	8.5%
Jefferson	1.9%	11.8%
Jefferson Davis	11.4%	9.0%
Lafayette	10.2%	11.0%
Lafourche	9.9%	7.1%
Orleans	1.2%	17.1%
Plaquemines	10.9%	9.9%
St. Bernard	2.7%	9.2%
St. Charles	1.4%	8.7%
St. Helena	3.7%	4.5%
St. Martin	10.3%	8.4%
St. Mary	9.3%	12.2%
St. Tammany	2.2%	9.7%
Tangipahoa	2.6%	10.7%
Tensas	23.4%	3.7%
Terrebonne	11.8%	10.7%
Vermilion	15.5%	6.7%
Washington	6.4%	7.5%

Source: 2012–2016 American Community Survey 5-year estimates (U.S. Census Bureau 2018)

Note: Gray-shaded cells indicate that the industry category is one of the top four industries contributing to the parish's employment level.

In 2008, LDWF published the report *The Economic Benefits of Fisheries, Wildlife, and Boating Resources in the State of Louisiana – 2006* (LDWF 2008). Because the study was conducted before the DWH Oil Spill, the data provided in the report are useful for understanding the baseline economic contributions that hunting, fishing, wildlife viewing, and recreational boating provided to the State of Louisiana economy prior to the spill. As stated in the report, “hundreds of thousands of people depend on these resources for recreation, employment, and as a source of food for their families.” Table 4.2-10 identifies the estimated retail sales, total economic effect, jobs supported, and state and local tax revenues that these activities contributed to the Louisiana economy in 2006.

Table 4.2-10. Estimated Recreation Revenue Contributed to Louisiana Economy in 2006

Recreational Activity	Retail Sales (millions)	Total Economic Effect (millions)	Jobs Supported	State and Local Tax Revenues (millions)
Hunting	\$594	\$975	13,084	\$62.2
Fishing	\$1,060	\$1,710	18,122	\$114
Wildlife viewing, photography, and feeding	\$312.4	\$517.1	6,199	\$32.3
Boating	\$981.6	\$1,330	14,959	\$80.8

Source: LDWF (2008)

4.2.3.3 INFRASTRUCTURE

Most of the alternatives are located along the Gulf Coast, south of the Interstate 10 (I-10) corridor. A few of the alternatives are located further inland, one is located just north of I-10 near Lake Charles, and two other alternatives would be accessed using Interstate 55 (I-55). Several of the alternatives are located in or near the New Orleans–Metairie–Kenner metropolitan area. Infrastructure that exists within or around the proposed sites includes traffic and transportation infrastructure; utility infrastructure (for power and water resources); and structures such as public restrooms or fishing piers. Federal interstates and U.S. Highways are present in several of the parishes where alternatives are located (Table 4.2-11) (Louisiana Department of Transportation and Development 2018). Numerous state highways, local roadways, canals, and navigable waterways are present in each parish.

Table 4.2-11. Federal Interstates and U.S. Highways in Parishes with Alternatives

Parish	Interstates	U.S. Highways
Calcasieu	I-10, I-210	U.S. Highways 90, 171
Cameron	None	None
Jefferson	I-10	U.S. Highways 61, 90
Lafourche	None	U.S. Highway 90
Orleans	I-10, I-510, I-610	U.S. Highways 11, 61, 90
Plaquemines	None	None
St. Bernard	None	None
St. Charles	I-10, I-310	U.S. Highways 61, 90
St. Helena	None	None
St. Mary	None	U.S. Highway 90
St. Tammany	I-10, I-12, I-59	U.S. Highways 11, 90, 190
Tangipahoa	I-12, I-55	U.S. Highways 51, 190
Terrebonne	None	U.S. Highway 90
Vermillion	None	U.S. Highway 167
Washington	None	None

The eight nutrient reduction alternatives are located in rural areas where agricultural activities are predominant. Most infrastructure in these areas, beyond federal, state and local roadways, consists of typical agricultural structures, such as barns, silos, and sheds.

4.2.3.4 CULTURAL RESOURCES

NEPA recognizes that a unique characteristic of an environment is its relation to historic or cultural resources and requires agency officials to consider the degree that an action might “adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places” (NRHP) (40 CFR 1508.27 [b][3] and 40 CFR 1508.27 [b][8]). However, under NEPA, no definition is provided for “cultural resources.” The NRHP, which was established under the National Historic Preservation Act of 1966, as amended (NHPA) (54 USC 3001 et seq.), identifies historic properties based on their relationship to significant historic events or individuals, important stylistic or engineering trends, or in their potential to provide information about the local, regional, or national past (36 CFR 60[a-d]). Historic properties may include archaeological sites, historic structures, historic districts, landscapes, battlefields, or shipwrecks. Also included are Traditional Cultural Properties, which may be defined as locations that are eligible for inclusion in the NRHP due to their association with practices or beliefs of a modern community that are tied to a community’s sense of history, place, or identity (Parker and King 1998).

Under Section 106 of the NHPA, agencies are required to make an attempt to identify, in coordination with other interested parties including State Historic Preservation Offices (SHPOs) and Native American tribal groups, whether historic properties are present within the area of effect of an undertaking and whether they would be significantly impacted by that undertaking. Projects which are directed, overseen, funded, partially funded or permitted by a federal agency are considered undertakings. The NEPA process may take the place of a Section 106 review, as long as the processes are substantially similar and involve the same parties (36 CFR 800.8).

In addition to NEPA and NHPA, other laws that may be involved in the protection of cultural and historic resources include the following:

- Louisiana Archaeological Resources Law (41 Louisiana Revised Statutes [RS] 1601–1615) and its implementing regulations (25 Louisiana Administrative Code Part I) considers all historic structures, archaeological sites, and shipwrecks located on lands belonging to the State of Louisiana as state property and defines penalties for unlawfully removing or disturbing these sites without a permit issued by the state.
- Louisiana Unmarked Human Burial Sites Preservation Act (8 RS 671–681) prevents the knowing disturbance of an unmarked human burial or the sale, purchase, trade, or destruction of human remains or burial artifacts.
- Louisiana Historic Cemetery Preservation Act (25 RS 931–943) prevents the intentional disturbance of marked, historic cemeteries.
- Louisiana Desecration of Graves (14 RS 101) prevents the unauthorized opening or damaging of any grave, tomb or mausoleum to the dead.
- Abandoned Shipwreck Act of 1987 (43 USC 2101–2106) establishes federal ownership (and state custodianship) for shipwrecks located within navigable waters of each state.
- American Indian Religious Freedom Act (42 USC 1996) requires that federal actions do not impede the free use or access to Native American religious sites and protects Native American religious practice.
- Antiquities Act of 1906 (54 USC 320301–320303 and 18 USC 1866[b]) provides for presidential designation of national monuments and provides protection from excavation of those sites unless authorized by a permit.

- Archaeological and Historic Preservation Act of 1974 (16 USC 469–469c) requires the preservation of historic and archaeological data that might be destroyed by federal construction projects or other federally licensed activities or programs, and establishes treatment programs for the care of archaeological collections.
- Archaeological Resources Protection Act (16 USC 470aa–mm) prevents the excavation, damage, or defacement of archaeological sites on federal or native land without permission from the land controlling agency and makes illegal the sale of artifacts recovered from federal property.
- Historic Sites Act of 1935 (54 USC 320101) allows the establishment and protection of National Historic Landmarks (which are also protected under the NHPA).
- Native American Graves and Repatriation Act (25 USC 3001–3013) protects cultural objects (Native American remains, funerary goods, sacred objects, or objects of cultural patrimony) to which modern native groups can show lineal descent or cultural affiliation, when they are in control of a federal land agency or museum controlling agency.
- Sunken Military Craft Act (10 USC 113 note) protects the wrecks of U.S. and foreign navy craft within U.S. waters.
- EO 13007 stipulates that all federal land agencies must attempt to accommodate access to Native American sacred sites and to avoid adversely affecting the physical integrity of such sites.

4.2.3.4.1 Cultural Setting

The history of Louisiana is one of a constant dance of land and water; when humans arrived in North America, the coastline lay far offshore of its current location, due to the extraordinary amount of water locked in the glaciers that capped the continent. At the end of the last glaciation, sea levels rose, but were met by the growing power of the Mississippi River, which carried tons of silt down to the Gulf, weighing down earlier deltas, creating new lands in former swamps, raising levees and eroding new channels. Humans have occupied that shifting space on the edge of sea, swamp, delta, and stream for the last 11,500 years. Nine distinct cultural periods have been identified within the region potentially affected by the alternatives. These periods are summarized in Table 4.2-12, and additional detail is provided in Appendix A.

Table 4.2-12. Cultural Periods within the Region Potentially Affected by the Alternatives

Period	Date	Major Characteristics
Paleoindian	10,000–8000 B.C.	Lithic tool assemblages including lanceolate projectile points found with Pleistocene-era megafauna kill sites. May be present on subsided landforms in the Gulf of Mexico that are subject to shoreline erosion, subsidence, or channel meander, and rising sea levels.
Archaic	8000–500 B.C.	Development of a broad subsistence base and increased use of regionally specific plant and animal resources. Adaptation in tool production to conform to new hunting techniques, food preparation, and related activities. Production of stone vessels, exotic trade materials, and ceramics.
Woodland	500 B.C.–A.D. 1200	Development of agriculture, increased use and variability of ceramics, proliferation of earthworks, and the appearance of the bow and arrow increased inter-societal trade of exotic items. Settlements aggregated around river valleys.
Mississippian	A.D. 1200–1542	Establishment of the Plaquemine culture in Louisiana. Maize becomes a central part of cultural diet over other food sources. Construction of large mound sites, and establishment of long-distance trade networks.

Period	Date	Major Characteristics
European Exploration	A.D. 1542–1699	Spain conducts first exploration of Louisiana ca. 1542 and encounters large settlements of Native Americans. Only minor European colonization occurred over the next 150 years.
European Colonization	A.D. 1699–1803	France begins to colonize the Louisiana Territory in the 1700s, whereas Spain establishes early missions in the area. European settlements focus on the Mississippi River in southern Louisiana, thus the French and Indian War (1754–1763). France relinquishes ownership of Louisiana to Spain until 1800. In 1803, the United States signs the Louisiana Purchase treaty with France.
Antebellum	A.D. 1803–1861	Orleans Territory becomes State of Louisiana in 1812. Louisiana flourishes as a result of slave labor at plantations along the Mississippi River, and the introduction of sugar cane crops. State population reaches 700,000 people, with most living in or near New Orleans.
Civil War and Reconstruction	A.D. 1861–1890	Louisiana experiences economic hardships during the Civil War, plantations decrease from 1,200 to fewer than 200, reorganization of statewide economics, and federal reconstruction begins.
Modern	A.D. 1890–present	Railroads as major form of transportation are replaced by modern roadways, increasing development into rural areas. The petroleum industry is developed with most oil and gas production in Louisiana occurring in the southern half of the state. Oil production expands after World War II and peaks in 1970, Agriculture, petroleum, fishing, and tourism, constitute the major economic drivers.

4.2.3.5 LAND USE AND AGRICULTURAL RESOURCES

Southern Louisiana’s diverse environment provides for a variety of land uses, including a multitude of agricultural uses. As part of a large water quality study, USGS published a general overview of the predominant land and resource uses in Southern Louisiana, including the parishes in the socioeconomic resource analysis area. The predominant land uses in Southern Louisiana are urban, forest/wildland, marshes, and agriculture. The predominant land-based agricultural uses include cotton, rice, pasture, fruits and vegetables, and soy/corn/sugar cane. More specific information on the value of agricultural products produced in each parish is provided in Table 4.2-13.

According to the USGS land and resource overview of Southern Louisiana, marshes cover large portions of the parishes that are along the coastline (i.e., St. Bernard, Plaquemines, Jefferson, Lafourche, Terrebonne, Iberia, Vermilion, and Cameron). Forest/wildland areas are concentrated between the Atchafalaya and Mississippi Rivers, between the Amite and Tangipahoa Rivers, and intermittently dispersed throughout the analysis area. The largest urban areas in the analysis area are concentrated along the Mississippi River and includes the metropolitan area of New Orleans, which is located partially within Orleans, St. Tammany, St. Bernard, Jefferson, and Plaquemines Parishes. Other urban land uses are located at the City of Houma in Terrebonne Parish, Lafayette in Lafayette Parish, Lake Charles in Calcasieu Parish, and Madison and Slidell in St. Tammany Parishes. Agricultural uses vary across the analysis area, but, in general, rice crops are more common in the western parishes (i.e., Cameron, Calcasieu, Vermilion, Lafayette, Jefferson Davis, and Acadia), soy/corn/sugar cane crops are more common in central parishes (i.e., Iberia, St. Mary, and St. Martin) and along the Mississippi River (i.e., Lafourche and St. Charles), pasture use is more common in northern parishes (i.e., Washington, Tangipahoa, and St. Helena), and fruits and vegetables crops are located primarily in Tangipahoa and Plaquemines Parishes.

Louisiana State University Agriculture Center conducts an annual summary of agricultural and natural resource contributions to the state economy. The summary includes detailed information of the cash values of animal enterprises (e.g., cattle, horses, dairy, poultry), plant enterprises (e.g., grains, beans, vegetables, forestry products), and fisheries and wildlife enterprises (e.g., crawfish, alligators, shrimp,

hunting leases) for each parish in the socioeconomic analysis area. Table 4.2-13 identifies the total value (rounded to nearest million) of these enterprises per each parish in the socioeconomic analysis area for year 2015 (the latest year a summary has been completed). From these data, the most prevalent types of agriculture and natural resources produced in each parish are identified in gray-shaded cells.

Table 4.2-13. Agricultural and Natural Resource Value Summary per Parish (rounded to nearest million)

Parish	Animal Enterprise (million)	Plant Enterprise (million)	Fisheries and Wildlife Enterprise (million)	Total Agricultural Value Produced (million)
Acadia	\$19	\$95	\$48	\$162
Calcasieu	\$68	\$43	\$8	\$119
Cameron	\$49	\$12	\$20	\$81
Catahoula	\$7	\$65	\$5	\$77
Concordia	\$18	\$78	\$3	\$99
Iberia	\$15	\$78	\$9	\$102
Jefferson	\$17	\$33	\$65	\$115
Jefferson Davis	\$18	\$93	\$50	\$161
Lafayette	\$37	\$40	\$4	\$81
Lafourche	\$25	\$62	\$58	\$145
Orleans	\$4	\$28	\$5	\$37
Plaquemines	\$8	\$18	\$117	\$143
St. Bernard	\$1	\$4	\$37	\$42
St. Charles	\$4	\$9	\$0.4	\$13
St. Helena	\$42	\$31	\$2	\$75
St. Martin	\$83	\$46	\$19	\$148
St. Mary	\$3	\$53	\$11	\$67
St. Tammany	\$67	\$37	\$20	\$124
Tangipahoa	\$51	\$51	\$1	\$103
Tensas	\$2	\$85	\$0.5	\$88
Terrebonne	\$7	\$18	\$100	\$125
Vermilion	\$55	\$90	\$98	\$243
Washington	\$51	\$39	\$2	\$92

Source: Louisiana State University (2015)

As can be anticipated, coastal parishes produced more fisheries and wildlife enterprise-based products (e.g., Plaquemines, St. Bernard, Vermilion Parishes), land-locked parishes such as Concordia and Tangipahoa produced more animal and plant enterprise-based products, and urban parishes such as Orleans and St. Charles produced relatively less overall agricultural products. Overall, of the parishes in the socioeconomic resource analysis area, Vermilion Parish produced the largest value of agriculture and natural resources in 2015.

Other important land uses in the socioeconomic resource analysis area include WMAs that are managed by LDWF and Fisheries and Louisiana State Parks. WMAs can be used for hunting, fishing, and recreation purposes with a valid state hunting license, fishing license, or Wild Louisiana Stamp. WMAs

that are located within the socioeconomic resource analysis area include Biloxi in St. Bernard Parish, Pass a Loutre in Plaquemines Parish, Lake Boeuf in Lafourche Parish, Point-aux-Chenes in Lafourche and Terrebonne Parishes, Atchafalaya Delta in St. Mary and Terrebonne Parishes, Attakapas Island in St. Mary, St. Martin, and Iberia Parishes, Sabine Island in Calcasieu Parish, Sandy Hollow in Tangipahoa Parish, Tangipahoa Parish School Board in Tangipahoa Parish, Joyce in Tangipahoa Parish, Lake Ramsay Savannah in St. Tammany Parish, and Pearl River in St. Tammany Parish. State Parks that are located within the socioeconomic resource analysis area include Sam Houston Jones State Park in Calcasieu Parish, Palmetto Island State Park in Vermilion Parish, Cypremort Point State Park in Iberia and St. Mary Parishes, La Fausse Pointe State Park in Iberia Parish, Grand Isle State Park in Jefferson Parish, Bayou Segnette State Park in Jefferson Parish, St. Bernard State Park in St. Bernard Parish, Bogue Chitto State Park in Washington Parish, Fairview State Park in St. Tammany Parish, and Fontainebleau State Park in St. Tammany Parish. In addition, LDWF manages Rockefeller Wildlife Refuge in Cameron Parish which offers opportunities fishing, trapping, wildlife viewing and boating, but does not allow hunting.

4.2.4 Aesthetics and Visual Resources

Visual resources are the visible, physical features of a landscape that have an aesthetic value to viewers from viewpoints such as residences, recreational areas, rivers, and highways, among others. Physical features that make up the visible landscape include land, water, vegetation, and human-made features (i.e., roadways, buildings, and structures), all of which contribute to the overall landscape and visual character of an area. In general terms, the landscape and visual character are like mental snapshots of a place and embody the defining and most memorable site features.

A view refers to a direct and unobstructed line-of-sight to an on- or off-site aesthetic resource, which may take the form of panoramic viewpoints from particular vantages. Existing views may be obstructed or blocked by modifications to the environment (e.g., grading, landscaping, and building construction).

Conversely, modifications to the existing environment may create or enhance view opportunities. All land has inherent visual values that warrant different levels of management. Aesthetic judgment, especially related to landscape views, is often considered subjective.

Public views are from vantage points that are publicly accessible, such as streets, freeways, parks, and vista points. These views are generally available to a greater number of people than private views. Private views are those that are only available from vantage points on private property. Private views across adjacent land uses are generally not protected unless specifically governed through an adopted general or specific plan, policy, or view preservation ordinance. Therefore, private views are not considered to be affected if an adjacent land use blocks such a view, especially if the alternative is within the zoning and design guidelines designated for the site.

The nutrient reduction alternatives would be located in existing agricultural and croplands. The visual characteristics of these areas are dominated by rural views that typically include active agricultural fields, marshlands, canals, with some county and farm roads, rural residents, and other farming support buildings.

Many of the proposed recreational use alternatives would be located in wildlife management areas, state parks, or areas managed for recreational use. The visual characteristics of wildlife management areas are typically dominated by inland marshlands, bottomland forests, estuaries, canals, passes, and few human-made structures. The visual characteristics of state parks and the other recreational use areas considered in this RP/EA are typically more developed and publicly accessible and include coastal beaches, rock jetties, canals, boat launches, interior access roads, parking lots, campgrounds, cabins, trails, docks, piers, boardwalks, pavilions, restroom facilities, event centers, and other park support buildings.

4.2.5 Public Health and Safety

4.2.5.1 NOISE

Noise is generally defined as unwanted sound. Sound is all around us, it becomes noise when it interferes with normal activities such as speech, concentration, or sleep. Ambient noise (the existing background noise environment) can be generated by a number of noise sources, including mobile sources, such as automobiles and trucks, and stationary sources such as construction sites, machinery, or industrial operations. In addition, there is an existing and variable level of natural ambient noise from sources such as wind, streams and rivers, wildlife, and other sources.

The sound levels and noise characteristics for the alternatives would vary based on their location. For those sites located along the Gulf Coast, the sound levels are expected to be influenced by high winds and waves as well as wildlife noises, such as bird calls. Under most conditions, the ambient (background) noise at less-developed sites is from waves, wind, and birds. Watercraft traffic and recreational activities may influence noise levels at many of the alternatives located near water bodies. For those sites located further inland and in rural areas, sound levels are influenced by vehicular traffic, nearby human residences, and possible agricultural activities. For sites in more urban environments, such as near the New Orleans metropolitan area, motorized traffic and human activities from nearby commercial and residential properties influence noise levels and conditions.

4.2.5.2 RESILIENCY

Coastal land loss is an important and ongoing challenge in Louisiana. Coastal land loss results from a combination of factors, including river channelization that alters important wetland flooding and sedimentation regimes, oil and gas channelization within marshes, land subsidence, and sea-level rise. Numerous additional anthropogenic impacts, such as dredging, filling, and residential development, have also limited the sustainability and resiliency of many coastal habitats.

Land loss reduces shorelines, marshes, and swamps that are a vital barrier and our first line of defense against storm surge and flooding. Coastal flooding has become an all too common occurrence due to powerful storm surges associated with tropical events made worse over the years by subsidence, sea level rise, and coastal land loss (CPRA 2017). Estimated future land loss estimates for the next 50 years range from 1,207 square miles to 4,123 square miles (CPRA 2017). This predicted land loss is in addition to the nearly 1,900 square miles of land area lost between 1932 and 2010 (CPRA 2017). Flood protection infrastructure becomes vulnerable as land erodes. Many of the major Louisiana urban centers such as metro New Orleans, the North Shore, and Lake Charles are projected to undergo significant increases in flood depths, and the low-lying areas of the coast are projected to see the most pronounced changes (Figure 4.2-4) (CPRA 2017).

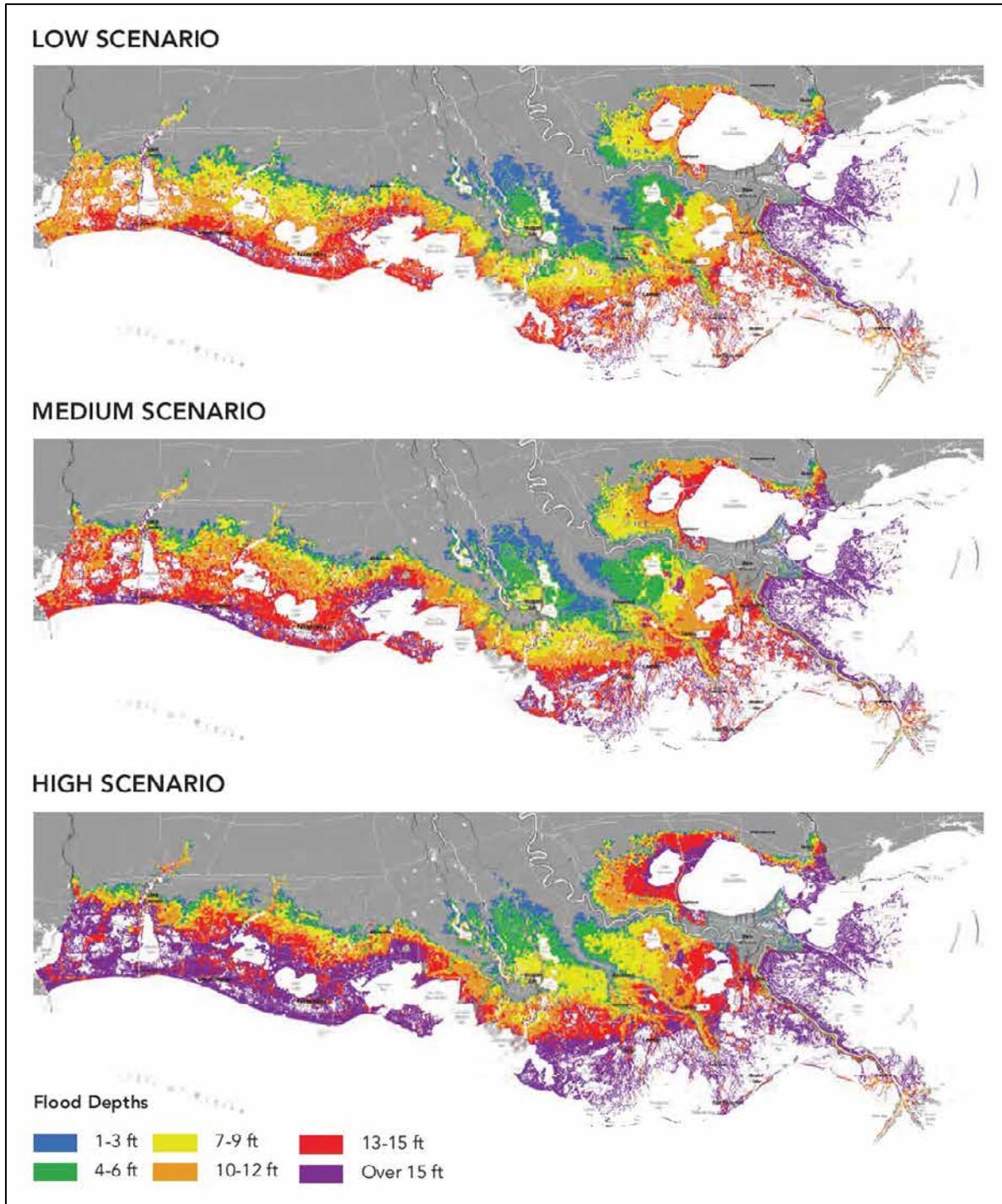


Figure 4.2-4. Projected flood depths in 2067 under modeled scenarios (CPRA 2017).

4.3 Environmental Consequences

As discussed at the beginning of Section 4, NEPA requires federal agencies to consider the environmental effects of their actions that include impacts on social, cultural, and economic resources, as well as on natural resources. To determine whether an action has the potential to result in significant impacts, the context and intensity of the action must be considered. Context refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). Intensity refers to the severity of impact and could include the timing of the action (more intense impacts would occur during critical periods like high visitation or wildlife breeding/rearing, etc.). Intensity is also described in terms of whether the impact would be beneficial or adverse.

For purposes of this document, impacts are characterized as minor, moderate or major, and short term or long term. The analysis of beneficial impacts focuses on the duration (short or long term), without attempting to specify the intensity of the benefit. The definition of these characterizations is consistent with that used in the Final PDARP/PEIS and can be found in Appendix A of this RP/EA. This Environmental Consequences section analyzes the beneficial and adverse impacts that would result from the implementation of any of the alternatives considered in this RP/EA.

Adverse is used in this section only to describe the federal Trustees' evaluation under NEPA. This term is defined and applied differently in consultations conducted pursuant to the ESA and other protected resource statutes. Accordingly, in the protected species sections below, there may be adverse impacts identified under NEPA; however, this does not necessarily mean that an action would be likely to adversely affect the same species under protected resources statutes. The results of any completed protected resource consultations are included in the administrative record.

The analysis of site-specific effects to resources as a result of the alternatives is provided in the Sections 4.5 and 4.6.

In order to present a concise discussion of potential impacts to protected species from each alternative, habitat requirements for each protected species were identified in Table 4.2-5. Federally protected species that are likely to occur in southern Louisiana were reviewed for each alternative. Those species that are likely to occur near each alternative are discussed below. Those species not likely to occur due to lack of suitable habitat are not discussed.

Furthermore, sources cited in protected species impact assessments in Sections 4.5 and 4.6, rely primarily on the following sources:

- *The Gulf of Mexico Ecosystem: A Coastal and Marine Atlas* (Love et al. 2013)
- Gulf of Mexico Data Atlas (NOAA 2018)
- NatureServe Explorer: An Online Encyclopedia of Life, Version 7.1 (NatureServe 2016)
- National Wetlands Inventory (USFWS 2017b)

Specific to cultural resources, if adverse effects to a historic property eligible for listing or listed in the NRHP are identified, steps must be taken, in consultation with the federal agencies, SHPO, tribes, other consulting parties, and, potentially, the Advisory Council on Historic Preservation, to avoid, minimize, or mitigate the adverse effects. Avoidance and minimization may include changing construction parameters, instituting more restrictive BMPs, or other administrative or engineering controls. Mitigation of effects may include intensive investigations to glean all significant data from affected portions of the resource, or other more far-ranging programs such as purchase and preservation of other historic resources, creation of preservation easements, documentation of resources outside of the area of effect, or even development of research or education programs related to historic preservation. A discussion of cultural resources that may be present near the alternatives is provided below.

All alternatives analyzed in this RP/EA are approved restoration approaches that have been identified and analyzed in Chapter 6 of the Final PDARP/PEIS (DWH Trustees 2016). The Trustees anticipate that the impacts from the alternatives would be the same as those described in the Final PDARP/PEIS. The sites selected for the alternatives do not present any unique circumstances that suggest the impacts would be different than those already analyzed in the Final PDARP/PEIS.

4.3.1 Best Management Practices and Conservation Measures

The Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) contains best practices to avoid or minimize impacts to natural resources, including protected and listed species and their habitats. Additional best practices are identified below, which generally include design criteria, BMPs, lessons learned, expert advice, and tips from the field. The environmental consequences described in Section 4.5 and Section 4.6, are presented largely without factoring in best practices that could avoid or minimize the potential adverse from an alternative. Instead, the best practices in the Final PDARP/PEIS and those listed below may be established during project planning and implementation by Implementing Trustees.

4.3.1.1 GEOLOGY AND SUBSTRATES

Specific measures would be implemented during construction to minimize erosion and overall soil impacts. To the extent possible, the alternatives would use the existing development footprints and disturbed areas (e.g., parking areas). These would include following established BMPs for construction activities such as the implementation of an erosion control and stormwater management plan, the installation of sediment traps prior to commencement of construction activities, and ongoing construction monitoring to ensure compliance. Any in-water work, such as construction of pilings, culverts, and launches, would be performed behind silt curtains to isolate construction impacts.

4.3.1.2 HYDROLOGY AND WATER QUALITY

Pollution prevention plans would be prepared as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include all specifications and BMPs necessary for control of erosion and sedimentation due to construction-related activities. The construction BMPs, in addition to other avoidance and mitigation measures as required by state and federal regulatory agencies, would minimize water quality and hydrology impacts.

4.3.1.3 AIR QUALITY

Emission-reduction measures to mitigate for short-term air quality impacts could include the use of ultra-low sulfur diesel fuel in off-road construction equipment, limiting unnecessary idling time of diesel-powered engines, controlling dust related to construction site activities, and covering trucks hauling loose materials.

4.3.1.4 ESSENTIAL FISH HABITAT

Measures that serve to mitigate impacts to EFH include the following:

- When impacts cannot be avoided, best practices would minimize the magnitude and duration of impacts to aquatic fauna, EFH, and managed species.
- Evaluation of impacts to EFH would continue during E&D to determine the extent of permanent impacts and any necessary offsets for these impacts.
- Signage, fencing, or landscaping can be used to focus foot and boat traffic to certain areas, thereby limiting shoreline and nearshore disturbances.

- Best practices during construction would likely include time-of-year restrictions for any in-water work (e.g., boardwalk construction) to avoid and minimize impacts to protected and managed species when they are expected to be present or when most vulnerable.
- Best practices during construction would also likely include standard erosion and sediment control measures (e.g., silt fence) to protect water quality and aquatic habitats from impacts resulting from construction stormwater and sediment runoff. Project design standards could include no net increase in stormwater runoff and associated pollutants.
- Unavoidable impacts to jurisdictional wetlands and waters would be mitigated, if necessary.
- EFH consultation guidance documents on the NMFS webpage may provide additional best practices to avoid or limit alternative impacts to EFH (NOAA Fisheries 2018d).

4.3.1.5 CULTURAL RESOURCES

Measures that serve to mitigate impacts to cultural resources include the following:

- Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions.
- Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions.
- Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

4.3.1.6 INFRASTRUCTURE

Measures that serve to mitigate impacts to infrastructure include the following:

- Prior to construction, a traffic control plan would be developed and implemented to ensure minimal interruptions to the transportation network. Care would be taken during construction activities to prevent impeding traffic flow and obstructing access to the alternative area.
- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

4.3.1.7 PUBLIC HEALTH AND SAFETY

Measures that serve to mitigate impacts to public health and safety include the following:

- Caution would be taken to prevent spills of oils and grease if handling fuels on site.
- Spill mitigation measures would be employed immediately following a spill of any hazardous material.
- The load compartments of trucks hauling dust-generating materials would be covered.
- Heavy water spray or chemical dust suppressant would be used in exposed areas to control airborne dust.

- Any produced waters or human waste would not be discharged unless the Department of Health and Hospitals requirements are met or exceeded.
- Flood access and evacuation plans would be filed on site.
- The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design.

4.3.1.8 NOISE

Mitigation measures that serve to limit noise impacts to humans from construction activities include the following:

- Limiting activity at alternatives to daytime hours
- Limiting truck traffic ingress/egress to the site to daytime hours
- Promoting awareness that producing prominent discrete tones and periodic noises (e.g., excessive dump truck gate banging) should be avoided as much as possible
- Requiring that work crews seek pre-approval for any weekend activities or activities outside of daytime hours
- Timing of in-water noise-producing activities to minimize disturbances to marine life
- Implementing standard practices, such as muffle units for generators, during construction operations to mitigate noise impacts

4.4 No Action Alternative

Section 1502.14(d) of the Council on Environmental Quality (CEQ) Regulations requires the alternatives analysis to “include the alternative of No Action.” The CEQ states that in some cases “No Action” is “no change” from current management direction or level of management intensity. Therefore, the No Action Alternative may be thought of in terms of continuing with the present course of action until that action is changed. Impacts of proposed actions would be compared to those impacts for the existing actions. Under the No Action Alternative, the LA TIG would not, at this time, select and implement the alternatives related to nutrient reduction and recreational use in this RP/EA intended to compensate for lost natural resources or their services resulting from the DWH Oil Spill. Accordingly, the No Action Alternative would not meet the purpose and need for implementing alternatives that address lost natural resources and their services as described in Section 5.3.2 of the Final PDARP/PEIS and in Section 1.5 of this RP/EA. The No Action Alternative would not meet the DWH Trustee goals of improving watershed health through nutrient reduction and enhancing recreational opportunities. If this plan was not implemented, none of the alternatives would be selected for implementation and restoration benefits and services associated with these alternatives would not be achieved at this time.

4.4.1 Physical Environment

4.4.1.1 GEOLOGY AND SUBSTRATES

The No Action Alternative would not have any direct adverse effects to geology, soils, or substrates because it would not involve any activities (e.g., construction, structure placement, etc.) that could result in effects. The No Action Alternative would not result in any beneficial effects to geology, soils, or substrates that may occur from implementation of some of the alternatives that include features that would prevent or reduce existing erosion conditions (e.g., breakwater, jetty, and groin placement to reduce coastal erosion, nutrient reduction to prevent excessive soil runoff, etc.).

4.4.1.2 HYDROLOGY AND WATER QUALITY

The No Action Alternative would not result in adverse effects to hydrology or water quality because it would not involve any activities that have potential to affect these resources. The No Action Alternative would not result in any beneficial effects to hydrology and water quality that may occur as a result of implementation of nutrient reduction alternatives. These alternatives are intended to reduce nutrients, sediment, and fecal coliform bacteria from entering receiving water bodies, which would benefit water quality. Additionally, some infrastructure features in the alternatives could result in reducing long-term erosion and sedimentation of receiving water bodies (e.g., placement of breakwaters, jetties and groins to reduce erosion in coastal areas). These benefits would not be realized under the No Action Alternative.

4.4.1.3 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

The No Action Alternative would have no effect on air quality or GHGs because no activities that have potential emissions would occur.

4.4.2 *Biological Environment*

4.4.2.1 TERRESTRIAL, COASTAL-NEARSHORE, AND MARINE HABITATS

The No Action Alternative would not result in effects to terrestrial, coastal-nearshore, or marine habitats as no restoration activities would occur under the alternative. Some alternatives may benefit habitats by reducing erosion and land loss in coastal areas. Nutrient reduction alternatives would benefit protected aquatic species through reduction of nutrients, sediment, and fecal coliform bacteria that are being flushed into receiving water bodies. In addition, winter water holding alternatives may be implemented with benefits to wildlife habitat included as a primary objective. Under the No Action Alternative, potential benefits to these habitats would not occur.

4.4.2.1.1 Protected Species

Protected Aquatic Species

The No Action Alternative would not result in effects to protected aquatic species because no activities would occur under the alternative. Some alternatives may have indirect benefits to protected aquatic species by reducing erosion and land loss in coastal areas. Nutrient reduction alternatives would benefit protected aquatic species through reduction of nutrients, sediment, and fecal coliform bacteria that are being flushed into receiving water bodies where protected aquatic species may be present. Under the No Action Alternative, potential benefits to these protected aquatic species would not occur.

Protected Terrestrial Species

The No Action Alternative would not result in effects to protected terrestrial species because no activities would occur under the alternative. Some alternatives may have indirect benefits to protected aquatic species by reducing erosion and land loss in coastal areas such as beaches that provide habitat for piping plover and red knot (*Calidris canutus*). Nutrient reduction alternatives would benefit protected terrestrial species through reduction of nutrients, sediment, and fecal coliform bacteria that are being flushed into receiving water bodies where species may be present for feeding or resting. Winter water holding alternatives may be implemented with benefits to wildlife included as a primary objective. Under the No Action Alternative, potential benefits to protected terrestrial species would not occur. There would be no effect to critical habitat.

4.4.2.1.2 Terrestrial Wildlife, including Migratory Birds

The No Action Alternative would not result in effects to terrestrial wildlife or migratory birds because no activities would occur under the alternative. Some alternatives may have indirect benefits to wildlife and birds, particularly those alternatives that result in reducing erosion and land loss in coastal areas such as beaches that provide habitat for many species. Nutrient reduction alternatives would benefit wildlife and migratory birds through reduction of nutrients, sediment, and fecal coliform bacteria that are being flushed into receiving water bodies where wildlife and migratory birds may be present for feeding or resting. Winter water holding alternatives may be implemented with benefits to wildlife and migratory birds included as a primary objective. Under the No Action Alternative, potential benefits to wildlife and migratory birds would not occur.

4.4.2.1.3 Marine and Estuarine Fauna

The No Action Alternative would not result in effects to marine and estuarine fauna because no activities would occur under the alternative. Some alternatives may have indirect benefits to these species, particularly those alternatives that result in reducing erosion and sedimentation of water bodies that provide habitat for coastal-nearshore and marine species. Nutrient reduction alternatives would benefit protected aquatic species through reduction of nutrients, sediment, and fecal coliform bacteria that are being flushed into receiving water bodies where aquatic species may be present for feeding or resting. Under the No Action Alternative, potential benefits to these coastal-nearshore and marine species would not occur.

4.4.2.1.4 Invasive Species

The No Action Alternative would not result in ground disturbing or other activities that could result in introduction or proliferation of invasive species.

4.4.3 Socioeconomic Environment

4.4.3.1 SOCIOECONOMIC RESOURCES AND ENVIRONMENTAL JUSTICE

The No Action Alternative would have no effect on socioeconomic resources or environmental justice. However, many of the alternatives are directed at improving or creating recreational and educational experiences in communities that qualify as environmental justice communities. These communities would not realize these benefits under the No Action Alternative.

4.4.3.2 TOURISM AND RECREATIONAL USE, INCLUDING RECREATIONAL FISHING AND HUNTING

The No Action Alternative would have no effect on tourism and recreational use including fishing and hunting. Many of the alternatives are directed at improving recreational use, particularly fishing. Under the No Action Alternative, these recreational use benefits would not be realized.

4.4.3.3 INFRASTRUCTURE

The No Action Alternative would not result in impacts to infrastructure because no activities would occur under the alternative. Many of the alternatives include upgrades and repairs to existing, degraded, or deteriorating infrastructure including roadways, parking areas, boat launches, fishing piers, trails, and boardwalks among others. Under the No Action Alternative, new and upgraded infrastructure would not occur, and these benefits would not be realized.

4.4.3.4 CULTURAL RESOURCES

There would be no effect to cultural resources as a result of the No Action Alternative.

4.4.3.5 LAND USE AND AGRICULTURAL RESOURCES

There would be no effect to land use or agricultural resources as a result of the No Action Alternative. Many of the alternatives include activities on existing agricultural lands intended to improve those resources and overall management. Under the No Action Alternative, these improvements would not be realized.

4.4.4 *Aesthetics and Visual Resources*

The No Action Alternative would not alter any of the existing conditions at any of the proposed nutrient reduction or recreational use alternative sites. For the alternatives that currently do not have any human infrastructure, the No Action Alternative would have no impacts to aesthetics and visual resources. For the alternatives that have deteriorating infrastructure, the No Action Alternative would allow the continued deterioration of this infrastructure, which would have a adverse, long-term effect on aesthetics for those areas. For the remainder of the alternatives, the No Action Alternative would have no impacts to aesthetics and visual resources.

4.4.5 *Public Health and Safety*

4.4.5.1 NOISE

There would be no noise effects as a result of the No Action Alternative

4.4.5.2 RESILIENCY

The No Action Alternative would not add any sea-level rise, hurricanes, and storm surge effects. Many of the alternatives include upgrades and repairs to existing, degraded, or deteriorating infrastructure including roadways, parking areas, boat launches, fishing piers, trails, and boardwalks, among others, that are currently not resilient and, in some cases, deteriorating as a result of these issues. Under the No Action Alternative, new and upgraded infrastructure designed with resiliency in mind would not occur, and these benefits would not be realized.

4.5 Environmental Consequences for Nutrient Reduction Alternatives

This section describes the programmatic approach to this NEPA analysis and for NEPA review after site-specific CPs have been identified. In addition to incorporating by reference the analysis USDA has conducted on the effects of its CPs, the discussion in this RP/EA includes examples of the CPs that could be implemented and how those example CPs are expected to impact the environment. Appendix D includes the full list of CPs that would be eligible for funding under the alternatives under Theme 1, Theme 2, and Theme 3.

USDA has a long-standing structured, interdisciplinary, science-based, and public process for developing CP standards and analyzing the effects of those practices. Implementing these CPs has been proven to successfully address natural resource concerns related to agricultural lands, and many of these CPs can be used to achieve a number of the restoration types identified in the Final PDARP/PEIS. Because of this,

nutrient reduction alternatives would use USDA CPs to achieve certain Final PDARP/PEIS restoration goals in Louisiana. This analysis hereby incorporates by reference the standards and specifications for the CPs in Appendix D that are found in NRCS's *National Handbook of Conservation Practices* (NRCS 2016a) and the analysis of the effects of those practices contained in NRCS's Conservation Practice Physical Effects matrices, the Network Effects Diagrams, and in NRCS's Conservation Effects Assessment Project reports. Each of those assessments is based on a review of the best available scientific studies and methodological approaches, as well as professional judgment. In addition, this RP/EA incorporates by reference the analyses from NRCS's March 2016 *Environmental Quality Incentives Program Final Programmatic Environmental Assessment* (NRCS 2016b).

Additionally, subsequent environmental review will occur in addition to this NEPA analytical approach to determine whether a planned site-specific action is below the maximum impacts described in this RP/EA. An example of the Environmental Evaluation Worksheet used to document this review is included in Appendix D. If the site-specific action is below the maximum impacts described in this RP/EA, the analysis of the effects will be documented on the Environmental Evaluation Worksheet and the action will proceed. The Environmental Evaluation Worksheet will be routed through the LA TIG to the administrative record, where it will be publicly available. If the evaluation of the planned site-specific action indicates the effects are likely to exceed the maximum impacts described in this RP/EA, the LA TIG will undertake additional site-specific environmental review consistent with NEPA requirements and other requirements for protection of the environment. The LA TIG does not propose to take actions that would result in any significant adverse impacts on the environment.

4.5.1 Conservation Measures and Best Management Practices

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS contains extensive best practices that would be followed, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). In addition, Section 4.3.1 of this RP/EA includes measures to avoid and minimize effects to geology, soils, and substrates; hydrology and water quality; air quality; cultural resources; infrastructure; and public health and safety. A MAM plan has been prepared for the Theme 1 alternatives and is located in Appendix C.

4.5.2 Theme 1. Nutrient Reduction on Dairy Farms

Alternatives under Theme 1 are as follows:

- Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes
- Nutrient Reduction on Dairy Farms in Washington Parish

4.5.2.1 PHYSICAL ENVIRONMENT

4.5.2.1.1 Geology and Substrates

Diversion (362)

This practice would be used to create an earth embankment, channel, or a combination of a ridge and channel constructed across a slope to collect or direct water flow. Soil excavation and grading associated with channel construction would result in short-term localized effects to geology and soils, such as increased erosion prior to the re-establishment of vegetation. Overall, long-term, beneficial effects to geology and soils from prevention of gully formation and reduction of soils erosion would be anticipated. Areas not in crop production would be replanted or seeded to prevent erosion after bank regrading. Erosion control plans would be implemented during and after construction.

Solid/Liquid Waste Separation Facility (632)

This practice would be used to construct a filtration or screening device, settling tank, settling basin, or settling channel to partition solids and nutrients from a waste stream. Soil excavation and grading associated with facility construction would result in short-term, localized effects to geology and soils, such as displacement of soils and compaction.

4.5.2.1.2 Hydrology and Water Quality

Diversion (362)

This practice would be used to create an earth embankment, channel, or a combination of ridge and channel constructed across a slope to collect or direct water flow. Short-term, localized impacts to hydrology, such as change in water flow and quantity, would result from soil excavation and grading to construct or install channels. The reduction of runoff, increase in water storage, and prevention of gully formation would result in beneficial effects to hydrology in the long term.

Installation of channels would require soil excavation and grading for construction, and in-water work may be necessary. This could result in short-term effects to water quality such as increased sedimentation. There would be long-term, beneficial effects to water quality from the reduction of runoff, which could contain contaminants, and prevention of erosion. Areas not in crop production would be replanted or seeded to prevent erosion after bank regrading. Erosion control plans would be implemented during and after construction.

There could be short-term, localized effects to wetlands depending on the location of the diversion such as increase in run-off or sedimentation. Wetlands would be avoided to the greatest extent possible as all CPs are intended to conserve and enhance important resources such as wetlands. The diversion would have a long-term, beneficial impact on wetland water quality, hydrology, species composition, and vigor by directing water run-off to appropriate storage areas or treatment facilities.

Solid/Liquid Waste Separation Facility (632)

This practice would be used to construct a filtration or screening device, settling tank, settling basin, or settling channel to partition solids and nutrients from a waste stream, which would result in short-term impacts to hydrology such as changes to surface water flow.

Short-term impacts to water quality, such as increased sedimentation, from soil excavation and grading would occur during construction of facilities. However, long-term benefits to water quality would result from increased filtration of water before it reaches waterways.

There could be long-term, localized effects to wetlands due to an accidental release of waste materials if the facility is placed near a wetland. However, implementation of features, safeguards, and/or management measures included in the CPs would minimize the risk or mitigate the impact. Wetlands would be avoided to the greatest extent possible and all CPs are intended to conserve and enhance important resources such as wetlands. The waste separation facility would have a long-term, beneficial effect on wetland water quality, hydrology, species composition, and vigor by removing high levels of nutrients from surface waters.

4.5.2.1.3 Air Quality and Greenhouse Gas Emissions

The primary sources of air quality and GHG emissions during alternative implementation would include seasonal equipment operation of tractors, dozers, and all-terrain vehicles associated with earth moving, seeding, planting, habitat management, and small construction activities. Implementation of CPs would

likely not occur simultaneously, and would result in emissions that are typical of normal farmstead operation; therefore, no meaningful change in air quality or GHG emissions would occur. The alternatives under Theme 1 would have no adverse, long-term impacts on air quality or to emissions of GHGs.

4.5.2.2 BIOLOGICAL ENVIRONMENT

4.5.2.2.1 Terrestrial, Coastal-Nearshore, and Marine Habitats

There would be no in-water marine work or work adjacent to estuarine habitats associated with the alternatives under Theme 1 and no effects would occur to these habitats.

Diversion (362)

There could be short-term effects to terrestrial habitats due to potential vegetation clearing to construct channels, although most disturbance is anticipated to occur in areas currently used for agricultural purposes that has been heavily modified from its original terrestrial habitat conditions. There would be long-term, beneficial effects from the creation of additional water body habitat.

Solid/Liquid Waste Separation Facility (632)

There could be long-term effects to terrestrial habitats due to potential vegetation clearing and loss of habitat due to placement of facilities. However, facilities would be located on active agricultural operations and constructed in areas to minimize these impacts. Long-term, beneficial effects would result from reducing or preventing nutrients from entering waterways, improving water quality and thus improving downstream aquatic habitats.

4.5.2.2.2 Protected Species

Protected Aquatic Species

There would be no in-water marine work or work adjacent to estuarine habitats associated with the alternatives under Theme 1. Therefore, effects to protected marine or estuarine species would not occur.

The alternatives under Theme 1 have potential to impact inflated (Alabama) heelsplitter (*Potamilus inflatus*) during construction. Implementation of CPs could disturb streambeds that provide suitable habitat for this species, and these impacts would be short term. Long term, implementation of CPs offered in the alternatives under Theme 1 would benefit this species as nutrients and fecal coliform bacteria would be removed from surface water prior to reaching streams.

Best practices and conservation measures as described in the Final PDARP/PEIS, as well as site-specific CPs implemented by USDA, would be followed during construction to avoid impacts to the inflated (Alabama) heelsplitter. All individuals working on implementation of the CPs would be provided with information in support of general awareness of this species' presence and means to avoid important habitats. Additionally, USDA would conduct environmental evaluations prior to the implementation of any CP, and if suitable habitat were noted for the inflated heelsplitter, BMPs and CPs would be implemented to mitigate or minimize short-term and long-term impacts.

Protected Terrestrial Species

The alternatives under Theme 1 have potential to affect the ringed map turtle and gopher tortoise. The ringed map turtle is found in streams with moderate to fast current, numerous basking logs, and a channel wide enough to allow the sun to reach the basking logs (Bonin 2006; NatureServe 2016). Construction of CPs could temporarily disturb riparian areas in and around streams or tributaries of the Pearl or Bogue

Chitto Rivers that provide suitable habitat for the ringed map turtle. However, these effects are anticipated to be localized and short term. Additionally, implementation of CPs could improve riparian areas for this species. The gopher tortoise could occur in herbaceous habitats and can tolerate burrowing in disturbed areas as long as access to herbaceous ground cover is sufficient for foraging (Bonin 2006; NatureServe 2016). Potential short-term impacts to the gopher tortoise, including disturbance from human presence and noise during construction of the CPs, could cause individuals to move into adjacent habitats. However, this disturbance would be temporary, and once construction has concluded, individuals could move back into the area. Long-term impacts to the gopher tortoise could include habitat modification if CPs are implemented within foraging or burrowing areas.

Best practices and conservation measures as described in the Final PDARP/PEIS, as well as site-specific CPs implemented by USDA would be followed during construction to avoid impacts to the gopher tortoise and ringed map turtle. All individuals working on the implementation of CPs would be provided with information in support of general awareness of these species' presence and means to avoid important habitats. Additionally, USDA would conduct environmental evaluations prior to the implementation of any CP, and if suitable habitat is noted for the gopher tortoise or ringed map turtle, BMPs and CPs would be implemented to mitigate or minimize short- and long-term impacts.

Protected Plant Species

The alternatives under Theme 1 would have no effect on the Louisiana quillwort. This species occurs in small streams in pine forests and CP implementation would occur on agricultural lands used for dairy farming and crop production.

Critical Habitat

No USFWS designated critical habitat overlaps any portion of the boundaries of the alternatives under Theme 1; therefore, no effect on critical habitat would occur.

4.5.2.2.3 Terrestrial Wildlife, including Migratory Birds

There would be short-term impacts to terrestrial wildlife and migratory birds due to noise and disturbance activity during construction. Noise from construction equipment is known to disturb some migratory species. These noises could be slightly more disturbing to any foraging, resting, or roosting birds that may use the site compared to baseline conditions, although all alternatives would occur on active farms, so these increases may be negligible. Wildlife sensitive to these disturbances would vacate the area during this period, but would return after construction is finished.

As previously discussed, the alternatives under Theme 1 would include BMPs described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with USDA, USFWS, and LDWF during alternative selection and design to avoid and minimize effects to species would be conducted prior to construction. Therefore, potential adverse impacts to wildlife would be minimal.

4.5.2.2.4 Marine and Estuarine Fauna

There would be no in-water marine work or work adjacent to estuarine habitats associated with the alternatives under Theme 1 and there would be no effect to marine and estuarine fauna.

4.5.2.2.5 Invasive Species

The construction of CPs in the alternatives under Theme 1 could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.5.2.3 SOCIOECONOMIC ENVIRONMENT

4.5.2.3.1 Socioeconomic Resources and Environmental Justice

Minority populations within the boundaries of the alternatives under Theme 1 range from 34.1% to 55.5% and the percentage of population level ranges from 22.3% to 27.6%. There would be no disproportionate impacts to low-income or minority populations as a result of the alternatives under Theme 1, particularly in light of USDA efforts to reach out to such populations. Landowners who voluntarily participate in the program would experience long-term socioeconomic benefits including program investments to improve cropland, pasture/grassland, associated agriculture lands, forestland and/or riparian areas; savings from CPs that reduce erosion and the associated costs for maintaining eroded drainage ways; cost reduction resulting from nutrient management; improved production/yield from crops from the implementation of soil and water CPs; and increases in the farmstead value because of the capital investment in farmstead improvements.

4.5.2.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternatives under Theme 1 would be carried out by the voluntary application of CPs by landowners on their own land. Private land does not offer any tourism or recreational benefits. CPs would primarily benefit participants; however, nutrient reduction improvements to water quality would benefit downstream uses by aquatic species including fish that may be subject to recreational fishing.

4.5.2.3.3 Infrastructure

No publicly owned or maintained infrastructure would be created or impacted as a result of these alternatives under Theme 1.

4.5.2.3.4 Cultural Resources

Implementation of CPs would occur at unknown locations within the focus areas (HUC 12s discussed above). As part of the CNMP that would be prepared by USDA in conjunction with the voluntary landowners, any SHPO and tribal consultation requirements would be conducted as part of the planning and implementation process on an alternative-specific basis.

4.5.2.3.5 Land Use and Agricultural Resources

Alternatives under Theme 1 would be voluntary implementation by private landowners of CPs planned and implemented under the guidance and oversight of USDA on cropland, associated agriculture lands, pasture/grassland, forestland, and riparian areas. The CPs are consistent with current farmstead uses and operation that otherwise would not have the benefit of conservation planning and oversight. The CPs would result in a beneficial effect to land use for landowners who voluntarily participate in the program.

4.5.2.4 AESTHETICS AND VISUAL RESOURCES

CPs would be implemented on cropland, associated agriculture lands, pasture/grassland, and forestland. CPs would be consistent with current farming practices and would have a negligible effect on aesthetic and visual resources.

4.5.2.5 PUBLIC HEALTH AND SAFETY

The conservation program is voluntary and would be completed on private land under the guidance of USDA. There would be beneficial effects to water quality in the watershed, which reduces risks to public health and safety. In addition, appropriate safety measures would be followed during CP design and installation.

4.5.2.5.1 Noise

There would be short-term noise impacts from equipment and operations associated with the installation of various CPs. CPs would be implemented sporadically and seasonally and on private land, away from densely populated areas or sensitive noise receptors (e.g., schools or hospitals). The types of noise produced would be typical of farmstead operations (e.g., plowing, harvesting, small earthmoving activities, land clearing).

4.5.2.5.2 Resiliency

The resiliency of the proposed CPs to sustain flooding from large storm events (elevation, size needed to accommodate 25-year, 24-hour storm events plus freeboard, etc.) would be determined during final design. To minimize short-term, adverse impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

4.5.3 Theme 2. Nutrient Reduction on Cropland and Grazing Lands

Alternatives under Theme 2 are as follows:

- Nutrient Reduction on Cropland and Grazing Land in Bayou Fosse
- Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes
- Nutrient Reduction on Cropland and Grazing Land in Iberia, St. Mary, and Vermilion Parishes

4.5.3.1 PHYSICAL ENVIRONMENT

4.5.3.1.1 Geology and Substrates

Residue Management (329)

This practice would be used to conserve and improve soil conditions and would result in short-term impacts, such as soil erosion, from annual tilling and harvesting of croplands. There would be long-term beneficial impacts to soils as management practices would reduce sheet and rill erosion, maintain or increase soil organic matter, and increase soil moisture.

Grassed Waterway (412)

This practice would be used to create a shaped or graded channel that is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet that would result in short-term impacts to geology and soils, such as increased erosion prior to the re-establishment of vegetation. The area would be replanted with vegetation that would serve to reduce erosion and provide benefits to wildlife. There would be long-term benefits from controlling and managing flow to prevent soil erosion, increases in soil infiltration and increased soil biological activity, and trapping of sediments in the waterways.

4.5.3.1.2 Hydrology and Water Quality

Residue Management (329)

This practice would be used to conserve and improve soil conditions and could result in short-term effects to hydrology, such as change in surface water flow, as a result of annual tilling and harvesting of croplands. There would be long-term, beneficial effects to hydrology from the reduction of runoff and increased water retention in soils. There would be long-term, beneficial effects to water quality from the reduction of runoff, which could contain contaminants and sediment, and prevention of sheet and rill erosion.

There would be no effects to wetlands as these areas are generally unsuitable for crop production. Additionally, wetlands are avoided to the greatest extent possible and CPs are intended to conserve and enhance important resources such as wetlands.

Grassed Waterway (412)

This practice would be used to create a shaped or graded channel that is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet that may redirect runoff slightly, but would not be anticipated to affect hydrology. The area would be replanted with vegetation that would serve to reduce erosion and provide benefits to wildlife. There would be long-term benefits to receiving water bodies from controlling, managing, and slowing hydrologic flow and preventing soil erosion.

There would be short-term impacts to water quality from the potential for increased erosion resulting from soil excavation and grading to construct or install grade stabilization structures including berms, riprap, and hard structures. Overall, long-term, beneficial effects from drainage way stabilization would be expected. Areas would be replanted or seeded to prevent erosion and gully formation after bank regrading. Erosion control plans would be implemented during and after construction.

There could be short-term impacts, such as increase in run-off or sedimentation, to wetlands depending on the location of the grassed waterway. Wetlands would be avoided to the greatest extent possible and all CPs are intended to conserve and enhance important resources such as wetlands. The grassed waterway would have a long-term, beneficial effect on wetland water quality, hydrology, species composition, and vigor by improving water quality and directing runoff without causing erosion.

4.5.3.1.3 Air Quality and Greenhouse Gas Emissions

The primary sources of emissions during alternative implementation would include equipment operation such as tractors, dozers, and all-terrain vehicles associated with earth moving, seeding, planting, habitat management, and small construction. Implementation of CPs would likely not occur simultaneously, and would result in emissions that are typical of normal farmstead operation; therefore, no meaningful change in air quality or GHG emissions would occur. The alternatives under Theme 2 would have no adverse, long-term impacts on air quality or to emissions of GHGs.

4.5.3.2 BIOLOGICAL ENVIRONMENT

4.5.3.2.1 Terrestrial, Coastal-Nearshore, and Marine Habitats

There would be no in-water marine work or work adjacent to estuarine habitats associated with the alternatives under Theme 2 and no effects would occur to these habitats.

Residue Management (329)

There could be minor, short-term impacts to terrestrial habitats during tilling, planting, and harvesting of crops as vegetation cover would change. However, implementation of this CP would allow for some vegetative cover to remain during certain periods of the crop cycle, providing habitat for some species.

Grassed Waterway (412)

There could be minor, short-term impacts to terrestrial habitats due to potential vegetation clearing, although most disturbance is anticipated to occur in areas currently used for agricultural purposes that have been heavily modified from original terrestrial habitat conditions. There would be long-term, beneficial effects with the creation of additional water body habitat and improvement of downstream aquatic habitats.

4.5.3.2.2 Protected Species

Protected Aquatic Species

There would be no in-water estuarine or marine work associated with the alternatives under Theme 2 as none are present in the alternative area. Therefore, effects to protected aquatic species would not occur.

Protected Terrestrial Species

The alternatives under Theme 2 would not likely affect piping plover, red knot, and least tern. Initial construction and implementation of CPs may disturb protected species in the area due to increased human activity in and around suitable habitats, but these effects would be short term. Additionally, the creation of potentially suitable habitat may ultimately benefit these three species.

Best practices and conservation measures as described in the Final PDARP/PEIS, as well as site-specific CPs implemented by USDA would be followed during construction to avoid impacts to the piping plover, red knot, and least tern. All individuals working on the implementation of CPs would be provided with information in support of general awareness of these species' presence and means to avoid important habitats. Additionally, USDA would conduct environmental evaluations prior to the implementation of any CP, and if suitable habitat is noted for the piping plover, red knot, and least tern, BMPs and CPs would be implemented to mitigate or minimize short- and long-term impacts.

Critical Habitat

Designated critical habitat for the piping plover overlaps the extreme southern portions of the alternative under Theme 2, Nutrient Reduction on Cropland and Grazing Land in Iberia, St. Mary, and Vermilion Parishes. Implementation of CPs would occur on existing agricultural lands and would not occur within these habitats. Adverse effects are not expected to occur to designated piping plover critical habitat.

4.5.3.2.3 Terrestrial Wildlife, including Migratory Birds

There would be minor, short-term to moderate impacts to terrestrial wildlife and migratory birds due to noise and disturbance activity during construction or crop production. Noise from large equipment use could disturb some species. These noises could be slightly more disturbing to any foraging, resting, or roosting birds that may use the site compared to baseline conditions, although all alternatives would occur on active farms, so these increases may be negligible. Wildlife in and around the alternatives may be sensitive to changes to habitats or changes in noise sources or levels due to activities, and could vacate the area during these times, but would return when activities had ceased.

As previously discussed, the alternatives under Theme 2 would include BMPs described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with USDA, USFWS, and LDWF during alternative selection and design to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

Marine and Estuarine Fauna

There would be no in-water marine work or work adjacent to estuarine habitats associated with the alternatives under Theme 2. As a result, there would be no effect to these species.

4.5.3.2.4 Invasive Species

The construction of CPs in the alternatives under Theme 2 could result in the spread of invasive species near the alternatives, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.5.3.3 SOCIOECONOMIC ENVIRONMENT

4.5.3.3.1 Socioeconomic Resources and Environmental Justice

Minority populations within the boundaries of the alternatives under Theme 2 range from 21.3% to 57.8% and the percentage of population below poverty level ranges from 17.3% to 33.8%. There would be no disproportionate impacts to low-income or minority populations as a result of the alternatives under Theme 2, particularly in light of USDA efforts to reach out to such populations. Landowners who voluntarily participate in the program would experience long-term socioeconomic benefits including program investments to improve cropland, pasture/grassland, associated agriculture lands, forestland and/or riparian areas; savings from CPs that reduce erosion and the associated costs for maintaining eroded drainage ways, cost reduction resulting from nutrient management, improved production/yield from crops from the implementation of soil and water CPs, and increases in the farmstead value because of the capital investment in farmstead improvements.

4.5.3.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternatives under Theme 2 would be carried out by the voluntary application of CPs by landowners on their own land. Private land is not subject to tourism and any recreational benefits associated with the implementation of CPs would primarily benefit participants. However, nutrient reduction improvements to water quality could benefit downstream uses by aquatic species including fish that may be subject to recreational fishing.

4.5.3.3.3 Infrastructure

No publicly owned or maintained infrastructure would be created or impacted as a result of these alternatives under Theme 2.

4.5.3.3.4 Cultural Resources

Implementation of CPs would occur at unknown locations within the focus areas (HUC 12s discussed above). As part of the CNMP that would be prepared by USDA in conjunction with the voluntary landowners, any SHPO and tribal consultation requirements would be conducted as part of the planning and implementation process on an alternative-specific basis.

4.5.3.3.5 Land Use and Agricultural Resources

Alternatives under Theme 2 would be voluntary implementation by private landowners of CPs planned and implemented under the guidance and oversight of USDA on cropland, associated agriculture lands, pasture/grassland, forestland and riparian areas. The CPs are consistent with current farmstead uses and operation that otherwise would not have the benefit of conservation planning and oversight. The CPs would result in a beneficial effect to land use for landowners who voluntarily participate in the program.

4.5.3.4 AESTHETICS AND VISUAL RESOURCES

CPs would be implemented on cropland, associated agriculture lands, pasture/grassland, and forestland. CPs would be consistent with current farming practices and would have a negligible effect on aesthetic and visual resources.

4.5.3.5 PUBLIC HEALTH AND SAFETY

The conservation program is voluntary and would be completed on private land under the guidance of USDA. There would be beneficial effects to water quality in the watershed, which reduces risks to public health and safety. In addition, appropriate safety measures would be followed during CP design and installation.

4.5.3.5.1 Noise

There would be short-term noise minor impacts from equipment and operations associated with the installation of various CPs. CPs would be implemented sporadically and seasonally and on private land, away from densely populated areas or sensitive noise receptors (e.g., schools or hospitals). The types of noise produced would be typical of farmstead operations (e.g., plowing, harvesting, small earthmoving activities, land clearing).

4.5.3.5.2 Resiliency

The resiliency of the proposed CPs to sustain flooding from large storm events (elevation, size needed to accommodate 25-year, 24-hour storm events plus freeboard, etc.) would be determined during final design. To minimize adverse, short-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

4.5.4 Theme 3. Winter Water Holding on Cropland

Alternatives under Theme 3 are as follows:

- Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agriculture Best Management Practices
- Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes
- Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS contains extensive BMPs that would be followed, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). In addition, Section 4.3.1 of this RP/EA includes measures to avoid and minimize effects to geology, soils, and substrates; hydrology and water quality; air quality; cultural resources; infrastructure; and public health and safety. A MAM plan has been prepared for the Theme 3 alternatives and is located in Appendix C.

4.5.4.1 PHYSICAL ENVIRONMENT

4.5.4.1.1 Geology and Substrates

Pumping Plant (533)

This practice would be used to construct a pumping facility to transfer water. Soil excavation and grading to construct the needed facilities would result on minor, short-term effects, such as erosion.

Shallow Water Development and Management (646)

This practice would be used to inundate selected areas to provide habitat for fish and/or wildlife. There would be long-term benefits from controlling and managing water to prevent soil erosion and trapping of sediments in the flooded areas.

4.5.4.1.2 Hydrology and Water Quality

Pumping Plant (533)

This practice would be used to construct a pumping facility to transfer water, which would result in short-term impacts, such as changes to surface water flow and hydrology from soil excavation and grading to construct the needed facilities. Although surface and ground water could be redirected, adverse effects to hydrology would not be anticipated. However, long-term, beneficial effects to hydrology would occur as a result of maintaining critical water levels in existing swamps, marshes, or open water and for providing water sources for newly constructed wetlands and ponds.

There would be minor, short-term impacts, such as increase in sedimentation, to water quality from soil excavation and grading to construct the needed facilities. There would be long-term, beneficial effects to water quality by removing excess surface or ground water to suitable areas such as ponds, ditches, or wetlands, thereby preventing nutrients and sediment in runoff from entering downstream water bodies.

There would be long-term, beneficial effects to wetlands as pumping plants are used in conservation efforts, including providing a dependable water source or disposal facility for water management in wetlands.

Shallow Water Development and Management (646)

This practice would be used to inundate selected areas to provide habitat for fish and/or wildlife. There would be long-term benefits to hydrology from controlling and managing hydrologic flow and preventing soil erosion.

There would be long-term, beneficial effects to water quality by providing holding areas where nutrients can be removed from water before it reaches downstream water bodies.

There would be long term beneficial effects to wetlands as this CP creates more wetland areas. Additionally, this practice can enhance or rehabilitate wetland areas by improving soils, hydrology, and vegetation community back to a close approximation of original conditions or into a wetland that is different than what previously existed at the site.

4.5.4.1.3 Air Quality and Greenhouse Gas Emissions

The primary sources of emissions during alternative implementation would include equipment operation such as tractors, dozers, and all-terrain vehicles associated with earth moving, seeding, planting, habitat management, and small construction. Implementation of CPs would likely not occur simultaneously, and would result in emissions that are typical of normal farmstead operation; therefore, no meaningful change in air quality or GHG emissions would occur. The alternatives under Theme 3 would have no adverse, long-term impacts on air quality or to emissions of GHGs.

4.5.4.2 BIOLOGICAL ENVIRONMENT

4.5.4.2.1 Terrestrial, Coastal-Nearshore, and Marine Habitats

There would be no in-water marine work or work adjacent to estuarine habitats associated with the alternatives under Theme 3 and no effects would occur to these habitats.

Pumping Plant (533)

There could be minor, long-term impacts to terrestrial habitats due to potential vegetation clearing and loss of habitat due to placement of facilities, although most disturbance is anticipated to occur in areas currently used for agricultural purposes that have been heavily modified from original terrestrial habitat conditions.

Shallow Water Development and Management (646)

There would be minor, short-term impacts during the creation of shallow water development sites that could disturb stop over and wintering habitats for avian species. There would be long-term, beneficial effects with the creation of wetlands providing habitat for wildlife and encouraging plant diversity. Additionally, the implementation of this CP would create potential stop over habitats during fall or spring migration or wintering habitats.

4.5.4.2.2 Protected Species

Protected Aquatic Species

There would be no in-water estuarine or marine work associated with the alternatives under Theme 3. Therefore, no effects on protected marine or estuarine species would occur.

Protected Terrestrial Species

The alternatives under Theme 3 would not likely affect piping plover, red knot, and least tern. Initial construction and implementation of CPs may disturb protected species in the area due to increased human activity in and around suitable habitats, but these effects would be short term. Additionally, the creation of potentially suitable habitat may ultimately benefit these three species.

Best practices and conservation measures as described in the Final PDARP/PEIS as well as site-specific CPs implemented by USDA would be followed during construction to avoid impacts to the piping plover, red knot, and least tern. All individuals working on the implementation of CPs would be provided with information in support of general awareness of these species' presence and means to avoid important habitats. Additionally, USDA would conduct environmental evaluations prior to the implementation of any CP, and if suitable habitat is noted for the piping plover, red knot, and least tern, CPs would be implemented to mitigate or minimize potential minor short- and long-term impacts.

Critical Habitat

Designated critical habitat for the piping plover overlaps the extreme southern portions of the alternative under Theme 3, Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices. Implementation of CPs would occur on existing agricultural lands and would not occur within these habitats. Adverse effects are not expected to occur to designated piping plover critical habitat.

Terrestrial Wildlife, including Migratory Birds

There would be minor to moderate, short-term impacts to terrestrial wildlife and migratory birds due to noise and disturbance activity during construction. Noise from construction equipment is known to disturb some migratory species. These noises could be slightly more disturbing to any foraging, resting, or roosting birds that may use the site compared to baseline conditions, although all alternatives would occur on active farms, so these increases may be negligible. Wildlife in and around the alternatives may

be sensitive to changes to habitats or in noise sources or levels due to activities and could vacate the area during these times, but would return when activities had ceased. Also, the creation of habitat with the implementation of CPs would benefit species in the long term.

As previously discussed, the alternatives under Theme 3 would include BMPs described in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with USDA, USFWS, and LDWF during alternative selection and design to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.5.4.2.3 Marine and Estuarine Fauna

There would be no in-water marine work or work adjacent to estuarine habitats associated with the alternatives under Theme 3. As a result, there would be no effect on these species.

4.5.4.2.4 Invasive Species

The construction of CPs in the alternatives under Theme could result in the spread of invasive species near the alternatives, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.5.4.3 SOCIOECONOMIC ENVIRONMENT

4.5.4.3.1 Socioeconomic Resources and Environmental Justice

Minority populations within the alternatives under Theme 3 boundaries range from 7.3% to 57.8% and the percentage of population below poverty level ranges from 8.9% to 33.8%. There would be no disproportionate impacts to low-income or minority populations as a result of the alternatives under Theme 3, particularly in light of USDA efforts to reach out to such populations. Landowners who voluntarily participate in the program could experience long-term socioeconomic benefits including program investments to improve cropland, pasture/grassland, associated agriculture lands, forestland and/or riparian areas; savings from CPs that reduce erosion and the associated costs for maintaining eroded drainage ways; cost reduction resulting from nutrient management; improved production/yield from crops from the implementation of soil and water CPs; and increases in the farmstead value because of the capital investment in farmstead improvements.

4.5.4.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternatives under Theme 3 would be carried out by the voluntary application of CPs by landowners on their own land. Private land does not offer any tourism or recreational benefits; however, waterfowl hunting could be permitted by landowners on winter water holding areas. CPs would primarily benefit participants; however, nutrient reduction improvements to water quality could benefit downstream uses by aquatic species including fish that may be subject to recreational fishing.

4.5.4.3.3 Infrastructure

No publicly owned or maintained infrastructure would be created or impacted as a result of these alternatives under Theme 3.

4.5.4.3.4 Cultural Resources

The specific location of CP implementation is unknown at this time; however, the focus areas are within the HUC 12s discussed above. As part of the conservation planning, USDA would conduct a site-specific environmental evaluation, which will include a cultural review. USDA would avoid impacts to cultural resources.

4.5.4.3.5 Land Use and Agricultural Resources

Alternatives under Theme 3 would be voluntary implementation by private landowners of CPs planned and implemented according to USDA standards and specifications on cropland, associated agriculture lands, pasture/grassland, forestland and riparian areas. The implementation of CPs is consistent with typical land management associated with agricultural lands. The CPs would likely result in a beneficial effect to land use for landowners who voluntarily participate in the program.

4.5.4.4 AESTHETICS AND VISUAL RESOURCES

CPs would be implemented on cropland, associated agriculture lands, pasture/grassland, and forestland. CPs would be consistent with current farming practices and would have a negligible effect on aesthetic and visual resources.

4.5.4.5 PUBLIC HEALTH AND SAFETY

The conservation program is voluntary and would be completed on private lands under the guidance of USDA. There would be beneficial effects to water quality in the watershed, which reduces risks to public health and safety. In addition, appropriate safety measures would be followed during CP implementation.

4.5.4.5.1 Noise

There would be minor, short-term noise impacts from equipment and operations associated with the installation of various CPs. CPs would be implemented intermittently and seasonally and on private lands, away from densely populated areas or sensitive noise receptors (e.g., schools or hospitals). The types of noise produced would be typical of farmstead operations (e.g., plowing, harvesting, small earthmoving activities, land clearing).

4.5.4.5.2 Resiliency

The resiliency of the proposed CPs to sustain flooding from large storm events (elevation, size needed to accommodate 25-year, 24-hour storm events plus freeboard, etc.) would be determined during engineering planning and design of structural practices. To minimize adverse, minor, and short-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

4.6 Environmental Consequences for Recreational Use Alternatives

4.6.1 Pass-a-Loutre Wildlife Management Area Crevasse Access

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.1.1 PHYSICAL ENVIRONMENT

4.6.1.1.1 Geology and Substrates

Proposed activities are not anticipated to noticeably affect the overall surficial geology in the Pass-a-Loutre WMA. However, dredging would affect existing substrates long term. Sediment dredged for the alternative would be placed on adjacent wetlands just above the tidal elevation to provide nesting habitat, slightly altering the existing topsoil. Operation and maintenance of the crevasses may require periodic dredging, which could also affect soils and substrates. Soils in the alternative are Balize and Larose soil complex, which are Aquent soils consisting of primarily fine silt deposits. Soils in the area are frequently flooded and undergo regular dredging. Soils are very poorly drained, typically inundated with slopes approaching 0 degrees, and have slight erodibility. Regional geology includes Quaternary (Holocene) alluvial, deltaic, interdeltic coastal, and shallow marine sediments of sand, silt, and clay high in organic content, such as peat, in some areas (EPA 2006).

Impacts to substrates from in-water work (dredging) would be anticipated at all five crevasse locations. The total volume of impacted substrate would be subject to final design and dependent upon existing water depths; however, the estimated area of substrate to be dredged would be approximately 5 acres (214,250 square feet). Impacts to substrates would be minor and long term. However, many of the proposed crevasses are already existing, frequently dredged, or regularly disturbed by users gaining access, which suggests substrate impacts would be localized.

Excavation in upland and shoreline areas is not planned. Dredge spoils would be placed on or along existing shorelines adjacent to dredged areas, which could affect soils. The area of shoreline affected by dredge spoils would be determined during final design, or in the field based on site conditions. Impacts to soils are expected to be long term, but dredge spoils and the shoreline soils are very similar material, and there is a comparatively large amount of undisturbed shoreline adjacent to each dredged area.

Because proposed activities would be focused on in-water work (dredging), soil reclamation is not planned for the alternative.

4.6.1.1.2 Hydrology and Water Quality

Dredging may affect water quality during construction by introducing sediment into the water column, which would increase turbidity. The alternative would implement hydrology and water quality BMPs described in Section 4.3.1 to avoid and minimize potential effects to the adjoining water bodies. Impacts to water quality would be short term. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during final design. Dredging for the crevasses could result in localized, longer-term minor impacts to hydrology. However, dredging activities are common throughout the Pass-a-Loutre WMA.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Stormwater pollution prevention plans (SWPPPs) would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any applicable specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.1.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative would include use of standard dredging equipment such as a barge-mounted bucket dredge or hydraulic dredge. During construction, minor, short-term impacts to air quality would occur from exhaust of gasoline- and diesel-powered equipment. Impacts to air quality would be expected to be localized and occur only during active construction activities. Long-term impacts could include an increase in emissions from the increased recreational motorized boat use through the new crevasses. These impacts would be negligible when compared to the exhaust produced by existing recreational boaters, and are not expected to cause an exceedance of the NAAQS.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term, and would not require a detailed assessment.

4.6.1.2 BIOLOGICAL ENVIRONMENT

4.6.1.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

Proposed construction activities related to dredging the five crevasses would not occur in terrestrial areas; therefore, impacts to terrestrial habitats are not expected. Dredging between 8 and 10 feet deep is proposed at the five crevasse locations, which would disturb aquatic vegetation and substrates in areas 30 to 100 feet wide and various lengths up to approximately 1,500 feet. Sediment dredged for the alternative would be placed on adjacent wetlands just above the tidal elevation to provide nesting habitat for a number of wetland species, such as secretive marsh birds and mottled ducks. This non-tidal habitat is lacking in this environment and believed to be one reason why the numbers of these wetland birds are in decline. By design, the alternative would enhance and nourish wetlands over 10 years by diverting sediment-laden river water off the river, or passes of the river, into shallow bodies of calm water. Once in these bays or ponds, the sediment from the water column drops out and builds new land.

Activities under the alternative are expected to disturb approximately 5 acres (214,250 square feet) of submerged area, which would result in short-term, moderate, and adverse impacts to aquatic habitat and long-term, moderate, and beneficial impacts to terrestrial habitat. Increased use of WMA areas by boaters would result from the alternative and could result in adverse, long-term effects on aquatic and shoreline habitats. However, these impacts would likely be minor when considering the relatively large size of the WMA, and that the types of habitat impacts would be consistent with existing recreational uses.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.1.2.2 Protected Species

Protected Aquatic Species

The alternative could have adverse, short-term impacts to the following species: marine life stages of hawksbill, Kemp's Ridley, leatherback, and loggerhead sea turtles; the West Indian manatee; the common bottlenose dolphin; and the Gulf and pallid sturgeons. The sea turtle species may occur in nearshore or inshore estuarine waters that contain seagrass or other submerged or emergent vegetation used as forage or may harbor prey species (NOAA Fisheries 2017). No large beds of SAV have been mapped within the alternative (Love et al. 2013; NOAA 2018); therefore, they are unlikely to occur near the alternative. However, small patches of sea grass may be present. In the unlikely event that a sea turtle moves into the alternative area, direct impacts may include disturbance via noise, disorientation, or reduced visibility due to turbidity from dredging.

The West Indian manatee occurs in warm shallow estuarine waters adjacent to a freshwater source and with seagrass or other submerged or emergent vegetation for forage. Sightings of manatees in Louisiana riverine habitats are rare and likely occur in areas where submerged or emergent aquatic vegetation is available for forage (LDWF 2018). Due to the proximity of the alternative to marine habitats, the common bottlenose dolphin may also occur in the area. In the unlikely event that a manatee or common bottlenose dolphin is present during construction of the alternative, impacts may include short term disturbance via human activities and noise from dredging activities and avoidance due to short term increased turbidity.

The pallid sturgeon can potentially occur in long, warm, free-flowing rivers with steep banks (NatureServe 2016). The Gulf sturgeon can potentially occur in river systems and nearshore bays and estuaries depending upon the life stage of the species and season (NOAA Fisheries 2016b). Although the alternative would be constructed in an area that provides suitable foraging habitat for these species, the scarcity of this species suggests a low probability it may occur in the alternative area. Short term impacts to the pallid sturgeon could occur from dredging activities resulting in potential minimal levels of habitat loss due to changes in channel depths and substrate composition, noise from dredging activities, and degradation of water quality from increased turbidity.

Protected aquatic species, such as bottlenose dolphins, in and around the alternative may be sensitive to changes in noise sources or levels related to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb fish and marine mammals. Conservation measures to protect marine mammals from noise are discussed in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A). The timing of in-water, noise-producing activities would be planned to minimize disturbances to marine life. BMPs, in addition to other avoidance and mitigation measures required by state and federal regulatory agencies, would minimize minor, short-term water quality impacts that could affect aquatic habitat.

Although protected species are not anticipated in the alternative area, these measures would minimize any short-term, adverse effects to aquatic habitats that may be used by protected aquatic species. Because protected aquatic species are not likely to occur in the area, and because conservation measures would be implemented, no adverse, long-term impacts to protected aquatic species are anticipated.

Protected Terrestrial Species

Protected terrestrial species identified as having potential to occur in Plaquemines Parish include piping plover and red knot (USFWS 2018), which are shorebirds. Shorebirds occupying shoreline environments where dredge spoils would be deposited would likely move to undisturbed habitat located adjacent to the alternative. Although suitable habitat for piping plover or red knot are not known to exist in the area, if

these shorebirds were present, they would be minor, short-term impacts during construction activities. The species would likely move back into the alternative area once construction is completed and effects would be short term.

Protected terrestrial species in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb shorebirds and would result in minor to moderate, short-term impacts. If necessary, best practices as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts to protected terrestrial species including shorebirds.

Critical Habitat

No critical habitat for any protected species is located within the alternative; therefore, the alternative would not be expected to have adverse effects to designated critical habitat. The alternative is located approximately 10 miles from critical habitat designated for the piping plover (Unit LA-5).

Terrestrial Wildlife, including Migratory Birds

Multiple migratory bird species identified as birds of conservation concern (USFWS 2018) have the potential to occur within the alternative. Most alternative-related work would be in-water; however, dredge spoils would be placed along adjacent shorelines, which could affect migratory birds. Potential effects from construction could include minor, short-term disturbance of foraging, nesting, or other habitat; disturbance from noise during and after construction; and erosion and sedimentation of aquatic areas near construction that terrestrial species rely on for foraging or resting. Long-term, beneficial impacts to migratory birds would result as increased nesting, foraging, and other habitat is provided by the dredged sediments.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse impacts to terrestrial wildlife would be minor and short term.

4.6.1.2.3 Marine and Estuarine Fauna

In-water work proposed for construction of access improvements would include dredging and dredge spoil disposal activities. In-water work would occur in relatively shallow, open water and wetland, freshwater habitats. Dredging the five crevasses would adversely impact approximately 5 acres (214,250 square feet) of aquatic habitats potentially used by aquatic species.

Designated EFH is present within the WMA and areas of the alternative. Although the adverse impacts from dredging may affect aquatic fauna, fisheries, and EFH in localized areas, the footprints of the crevasses are relatively small when compared to aquatic habitats available throughout the rest of the WMA, and temporary disturbances are expected to be limited in scope and duration. Temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby. Disturbed aquatic habitats are expected to revegetate naturally and disturbed aquatic species would likely move back into disturbed areas. Therefore, the alternative is expected to result in short-term impacts on aquatic fauna, local fisheries, and designated EFH.

The timing of in-water, noise-producing activities would be planned to minimize disturbances to marine life. Potential impacts to estuarine and aquatic fauna, managed fisheries, and EFH would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna, EFH, and managed species, as determined necessary by the Implementing Trustee. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.1.2.4 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.1.3 SOCIOECONOMIC ENVIRONMENT

4.6.1.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, environmental justice concerns could arise if the alternative would have a "disproportionately high and adverse" effect on a minority or low-income population. The alternative is located in Plaquemines Parish, which contains minority and low-income populations. However, the alternative is not expected to have a disproportionately adverse effect on these populations. The alternative intent is to provide a net recreational benefit to the communities near the Pass-a-Loutre WMA and surrounding region.

4.6.1.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would construct five crevasses, some of which are already existing and some would be new. These crevasses would serve to further enhance hunting and fishing access to currently difficult-to-reach areas. Improved access is expected to enhance the recreational use experience, and could allow an increased number of outdoorsmen and outdoorswomen to use the WMA. Effects on tourism and recreational use from the alternative would be beneficial and long term.

4.6.1.3.3 Infrastructure

Existing infrastructure in the Pass-a-Loutre WMA is generally limited to multiple passes used by boaters and several unimproved campgrounds. The new crevasses would enhance one existing pass and create four new passes. Each crevasse would be dredged to a depth of either 8 or 10 feet, and 30 to 100 feet wide. These features would be sufficient to accommodate boats without damaging the shoreline habitats. Dredging the crevasses could cause adverse, short-term impacts to recreational users. Long-term impacts to infrastructure from the alternative would be beneficial for recreational users.

4.6.1.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include

ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the Louisiana Division of Archaeology (LDOA) Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the five new crevasses and of the Pass-a-Loutre WMA. At this time, no previous cultural resources surveys have been conducted in the area, and no previously recorded cultural resources have been identified. Four known shipwrecks or obstruction points have been documented within the Mississippi River passes adjacent to the WMA near the proposed access structures. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.1.3.5 Land Use and Agricultural Resources

Lands proposed for use in implementing the alternative are under the ownership and management of LDWF for recreational uses. The alternative would not affect existing land uses. Agricultural lands are not present; therefore, there would be no impacts to agricultural resources from the alternative.

4.6.1.4 AESTHETICS AND VISUAL RESOURCES

Construction activities associated with the alternative would be limited to the creation of crevasses in natural spoil banks, which may impede the natural aesthetics and visual resources of the area during construction; however, such impacts would be short term in nature. Impacts from construction may be adverse, but localized, minor, and short term.

4.6.1.5 PUBLIC HEALTH AND SAFETY

4.6.1.5.1 Noise

Construction would result in localized noise associated with equipment use. These activities would result in adverse, minor, short-term noise impacts. Construction activities planned for the five crevasse locations would typically include operating a barge-mounted bucket dredge or hydraulic dredge. Dredge spoils would be placed along the shorelines adjacent to each dredged crevasse.

No communities are near the alternative. However, construction noise could impact recreational users in the alternative. Construction activities are expected to result in short-term, minor, adverse impacts near each alternative and in the immediate vicinity.

Construction noise would be short term, and any adverse impacts to the human environment during construction activities would be minor and short term. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts. After construction, recreational use along each crevasse could increase, which would likely increase noise experienced by other nearby recreational users. Long-term noise impacts associated with the alternative is minor when considering the relatively large scale of the WMA, and noise generated from the new crevasses would be similar to noises currently experienced by recreational users in the WMA.

4.6.1.5.2 Resiliency

The resiliency of the proposed crevasses to sustain sea-level rise, hurricanes, and storm surges would be determined during final design; however, to minimize adverse, minor, long-term impacts, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided to the extent practicable.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.

Construction activities may temporarily result in minor impacts the public health and safety at active construction sites.

4.6.2 Pass-a-Loutre Wildlife Management Area Campgrounds

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.2.1 PHYSICAL ENVIRONMENT

4.6.2.1.1 Geology and Substrates

Soils in the alternative are Balize and Larose soil complex, which are Aquent soils consisting of primarily fine silt deposits. Soils in the alternative are frequently flooded and undergo regular dredging. Soils are very poorly drained, typically inundated with slopes approaching 0 degrees, and have slight erodibility. Regional geology includes Quaternary (Holocene) alluvial, deltaic, interdeltic coastal, and shallow marine sediments of sand, silt, and clay high in organic content, such as peat, in some areas (EPA 2006). The alternative is not anticipated to noticeably affect the overall surficial geology in the Pass-a-Loutre WMA. However, dredging, pile driving, and installation of bulkheads would affect existing substrates. Operation and maintenance may require periodic dredging, which could also affect substrates.

Impacts to substrates from in-water work would result from dredging, pile driving, and installation of bulkheads, and would occur to varying degrees at all five campground locations. The total volume of impacted substrate would be subject to final design of the required dock pilings, dredging plan, and bulkhead design. Impacts to substrates would be adverse and long term, but because the area is frequently dredged, and disturbances would be localized, the impacts area expected to be relatively minor. Additionally, the long-term impact to substrate may be locally beneficial, as bulkheads at two of the campsites would reduce surface erosion.

Mechanical excavation in upland and shoreline areas is not planned, but fire pit installations may require small amounts of topsoil disturbance, which would be short term and minor.

4.6.2.1.2 Hydrology and Water Quality

Dredging, pile driving, and bulkhead installation may affect water quality during construction by introducing sediment into the water column, which would increase turbidity. The alternative would implement hydrology and water quality BMPs described in Section 4.3.1 to avoid and minimize potential effects to the adjoining water bodies. Impacts to water quality would be minor, short term, and localized.

Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during final design. Dredging for boat dock accesses could alter localized hydrology slightly over the long term, but dredging activities are common throughout the Pass-a-Loutre WMA.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. SWPPPs would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.2.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative would include use of standard dredging and construction equipment such as a barge-mounted dredge or a pile driver. During construction, impacts to air quality would occur from exhaust of gasoline- and diesel-powered equipment. Impacts to air quality would be localized and short term, occurring only during active construction activities. The alternative is expected to enhance the experience of recreational users. However, the alternative is not expected to increase the number of users to a degree where adverse impacts to GHG emissions from recreational use would be a concern.

Engine exhaust from construction equipment would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term, and would not require a detailed assessment.

4.6.2.2 BIOLOGICAL ENVIRONMENT

4.6.2.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative includes construction activities at five existing campgrounds. These sites generally consist of disturbed uplands and shorelines, as well as open water areas used by boaters. Terrestrial habitat in undisturbed areas is dominated by herbaceous plant communities of grasses, sedges, and rushes with scattered trees (EPA 2006). However, the campgrounds are regularly mowed for recreational use. Habitat impacts in these upland areas would result from fire pit installation and a relatively small area where each dock would intersect the shoreline. Impacts from the alternative on upland (terrestrial) habitat in these mostly disturbed areas is anticipated to be minor and short term.

In-water activities at each campground would include pile driving for the docks, whereas dredging would occur at three of the campgrounds and bulkhead installation would occur at two. These in-water construction activities would disturb aquatic vegetation and habitats resulting in minor to moderate, short-term impacts. Long-term recreational use of the campgrounds after construction is expected to increase over time. It is possible that the new boat docks and dredged boater access areas could reduce shoreline habitat impacts by guiding recreational users to a single point, rather than boaters using dispersed locations along the shoreline.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.2.2.2 Protected Species

Protected Aquatic Species

The alternative would have adverse, short-term impacts to the following species: marine life stages of green, Kemp's Ridley, and loggerhead sea turtles; the West Indian manatee; the common bottlenose dolphin; and the Gulf and pallid sturgeons. The sea turtle species may occur in nearshore or inshore estuarine waters that contain SAV used as forage or may harbor prey species (NOAA Fisheries 2017). No large beds of SAV have been mapped within the alternative (Love et al. 2013; NOAA 2018), however, small patches of sea grass may be present. In the unlikely event that a sea turtle moves into the alternative area, impacts may include disturbance via noise, disorientation, or reduced visibility due to turbidity from dredging.

The West Indian manatee occurs in warm shallow estuarine waters adjacent to a freshwater source and with SAV for foraging. Sightings of manatees in Louisiana riverine habitats are rare and likely occur in areas where SAV is present (LDWF 2018). Due to the proximity of the alternative to marine habitats, the common bottlenose dolphin may also occur in the area. In the unlikely event that a manatee or dolphin is present during construction of the alternative, impacts may include temporary disturbance via human activities and noise from construction activities and avoidance due to temporary increases in turbidity.

The pallid sturgeon can potentially occur in long, warm, free-flowing rivers with steep banks (NatureServe 2016). The Gulf sturgeon can potentially occur in river systems and nearshore bays and estuaries depending upon the life stage of the species and season (NOAA Fisheries 2016b). Both species have been documented in large riverine systems associated with and adjacent to Lake Pontchartrain, which is part of a different basin (LDWF 2017). Although the alternative does provide suitable foraging habitat for these species, the scarcity of this species suggests a low probability it may occur in the alternative area. Short-term impacts to the pallid sturgeon could occur from construction activities resulting in negligible habitat loss due to pile installation, backfilling behind bulkheads, and increased turbidity, but would be limited to the localized area.

Protected aquatic species, such as bottlenose dolphins, in and around the alternative may be sensitive to changes in noise sources or levels related to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb fish and marine mammals and would result in short-term, minor to moderate impacts. Conservation measures to protect marine mammals from noise are discussed in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A). BMPs, in addition to other avoidance and mitigation measures required by state and federal regulatory agencies, would minimize water quality impacts that could affect aquatic habitat.

Although protected species are not anticipated in the alternative area, these measures would minimize any short-term, minor, adverse effects to aquatic habitats that may be used by protected aquatic species. Because protected aquatic species are not likely to occur in the area, and because conservation measures would be implemented, no adverse, long-term impacts to protected aquatic species are anticipated.

Protected Terrestrial Species

Protected terrestrial species identified as having potential to occur in Plaquemines Parish include piping plover and red knot (USFWS 2018), which are shorebirds. Shorebirds occupying shoreline environments where construction activities would occur would likely move to undisturbed habitat located adjacent to the alternative. Although suitable habitat for piping plover or red knot are not known to exist in the area, if these shorebirds were present, they would likely move back into the area once construction is completed. Impacts to terrestrial protected species would be adverse, but minor and short term.

Protected species in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb shorebirds. If necessary, best practices as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts to protected terrestrial species including shorebirds.

Critical Habitat

No critical habitat for any protected species is located within the alternative; therefore, the alternative would not be expected to have adverse effects to designated critical habitat. The alternative is located approximately 10 miles from critical habitat designated for the piping plover (Unit LA-5).

4.6.2.2.3 Terrestrial Wildlife, including Migratory Birds

Multiple migratory bird species identified as birds of conservation concern (USFWS 2018) have the potential to occur within the alternative. The alternative would disturb shoreline and upland vegetation that could be used by terrestrial wildlife and migratory birds. Potential effects from construction could include minor removal of foraging, nesting, or other habitats; disturbance from noise during and after construction; and erosion and sedimentation of aquatic areas near construction that terrestrial species rely on for foraging or resting. Any impacts to migratory birds would be minor and short term.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions, although the site's proximity to waterway traffic may render these increases negligible. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse impacts to wildlife would be minor and short term.

4.6.2.2.4 Marine and Estuarine Fauna

In-water work proposed for construction of campground improvements would include dredging, pile driving, and installation of bulkheads. In-water work would occur in relatively shallow, open water and wetland, freshwater habitats, used by nearshore aquatic species. Designated EFH is present within the alternative. Although these impacts may affect aquatic fauna, fisheries, and EFH in localized areas, the impacted areas are relatively small when compared to aquatic habitats available throughout the rest of the WMA, and temporary disturbances are expected to be limited in scope and duration. Temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby. Disturbed aquatic habitats are expected to revegetate naturally and disturbed aquatic species would likely move back into disturbed areas. Therefore, effects resulting from the alternative on aquatic fauna, local fisheries, and designated EFH would be short term and localized.

The timing of in-water, noise-producing activities would be planned to minimize disturbances to marine life. Potential short-term, minor impacts to aquatic fauna, managed fisheries, and EFH would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna, EFH, and managed species, as determined necessary by the Implementing Trustee. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.2.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.2.3 SOCIOECONOMIC ENVIRONMENT

4.6.2.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, environmental justice concerns could arise if the alternative would have a "disproportionately high and adverse" effect on a minority or low-income population. The alternative is located in Plaquemines Parish, which contains minority and low-income populations. However, the alternative is not expected to have a disproportionately high adverse effect on these populations. The intent of the alternative is to provide a net recreational benefit to the communities near the Pass-a-Loutre WMA and surrounding region.

4.6.2.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The Pass-a-Loutre WMA is a popular destination for recreational sportsmen and sportswomen, and hosts approximately 20,000 visitors annually. The alternative would improve five existing campgrounds and boat dock facilities throughout the WMA. Improved campground and boat dock facilities would enhance recreational use and tourism in the WMA. Recreational fishing and hunting would also benefit by campground use by those groups. Effects on tourism and recreational use from the alternative would be beneficial and long term.

4.6.2.3.3 Infrastructure

Existing infrastructure in the Pass-a-Loutre WMA is generally limited to multiple passes used by boaters and several unimproved campgrounds. The campground improvements and new boat dock facilities would provide additional infrastructure available to recreational users. Alternative construction would impact campground users; however, impacts would be short term and localized. Infrastructure from the alternative would provide long-term benefits to recreational users.

4.6.2.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the campground locations and of the Pass-a-Loutre WMA. At this time, no previous cultural resources surveys have been conducted in the area, and no previously recorded cultural resources have been identified. Four shipwrecks or obstruction points have been documented within the Mississippi River passes adjacent to the WMA near the proposed access structures. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.2.3.5 Land Use and Agricultural Resources

Lands proposed for use in implementing the alternative are under the ownership and management of LDWF for recreational uses. The alternative would not affect existing land uses. Agricultural lands are not present; therefore, there would be no impacts to agricultural resources from the alternative.

4.6.2.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve improvements to the existing campgrounds, which would have a minor benefit to aesthetics of the site. The construction of bulkheads at two of the campgrounds could be considered unappealing to some recreational users but is necessary to improve the safety of those campgrounds, which would result in minor adverse effects to aesthetics.

Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. Overall, impacts from construction may be adverse, but localized, minor, and short term. No effects to the surrounding visual resources would be anticipated from the alternative. Overall, long-term impacts would be beneficial because improvements would enhance campground aesthetics by reducing shoreline erosion.

4.6.2.5 PUBLIC HEALTH AND SAFETY

4.6.2.5.1 Noise

Alternative construction would result in short-term, minor, localized noise associated with equipment use. These activities would result in adverse, short-term noise impacts. Construction activities during which noise is most likely to be generated include operating a barge-mounted dredge, driving pilings, and installing bulkheads. No communities are near the proposed campground locations. However, construction noise could impact recreational users in the area.

Construction noise would be temporary, and any adverse impacts to the human environment during construction activities would be minor and short term. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts. After construction, recreational use at each campground would resume. Intensity of recreational use is expected to be generally unaffected; therefore, noise generated from these would be similar to noises currently experienced by recreational users in the WMA.

4.6.2.5.2 Resiliency

The alternative includes improvements at five campgrounds, which would include new docks at each campground, new bulkheads at two campgrounds, and dredging at three campgrounds. The resiliency of these structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design; however, to minimize adverse, minor, long-term impacts, one mitigation measure would be employed, as follows:

- The use of impervious materials would be avoided to the extent practicable.

Construction activities may temporarily impact the public health and safety at active construction sites.

4.6.3 Grand Isle State Park Improvements

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.3.1 PHYSICAL ENVIRONMENT

4.6.3.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include extensions of the fishing pier and rock jetties. Operation and maintenance of these facilities may also affect soils and substrates. Soils at the alternative are Felicity loamy fine sand and Scatlake muck, neither of which are highly erodible.

In-water work associated with the fishing pier extension and extension of rock jetties would occur. The over-water area of the pier extension is estimated to be approximately 2,400 square feet. The pier construction would include placement of approximately 54 new treated wooden piles with at least a 15-foot sediment penetration depth using a pile driver. Short-term, minor substrate displacement and compaction from piling installation would result. The size of piles for the pier would be subject to final design. It is expected that less than 50 square feet of substrate would be permanently displaced in the marine environment. Jetty extensions would include the placement of large to boulder size rocks constituent with the existing jetties over a total length of approximately 4,000 feet in five different locations along Grand Isle. This would permanently convert existing substrates. The height would range from 24 to 48 inches and width would range from 22.5 to 35 feet for the jetty improvements and extensions.

Road, parking, and trail repairs would be limited to the existing footprint of these features and would not likely alter current geological, soil, or substrate conditions in the terrestrial environment. Repaving of roads and parking areas would include repairs to the road base, as needed, and an asphalt overlay creating a 2-inch lift. Trail repairs would likely be limited to laying new crushed rock along the existing trails.

Staging for construction equipment is anticipated to occur within the Grand Isle State Park on existing parking areas. Construction of the fishing pier and rock jetties would result in minor, long-term impacts soils and substrates within the footprint of these alternative features. Repairs to the roads, parking, and trails would not be expected to impact soils and substrates. Existing roadways and footpaths would be used to direct foot and vehicle traffic into designated areas, minimizing adverse impacts to the overall site during and after construction.

Disturbances to terrestrial soils would not likely occur on the site from the proposed construction. However, minor, short- and long-term disturbances to marine soils and substrates would occur from the placement of piles for the fishing pier construction and rocks for the jetty construction. These impacts would be localized to several small areas across the Grand Isle area. Stockpiling of soils would not be needed for these alternative elements. The placement of the rock jetties would likely have a minor long-term benefit to localized soils and substrates on Grand Isle due to the jetties' function of protecting the coastline from further erosion and promoting sediment retention in areas inland from the proposed jetty extensions.

4.6.3.1.2 Hydrology and Water Quality

The alternative includes in-water work for construction of the fishing pier and rock jetties. The alternative would implement the hydrology and water quality BMPs described in Section 4.3.1 to avoid and minimize potential effects to receiving water bodies. However, these effects would be minor, short term, and localized and would conclude once construction is completed. The area taken up by impervious surfaces within the Grand Isle State Park would not change as a result of the road, parking, and trail repairs. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. SWPPPs would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any applicable specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.3.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, small barges with cranes, small excavators, fork lifts, rollers, generators, small trucks, pile drivers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts would include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use that may result, the potential increase in emissions would be nominal.

4.6.3.2 BIOLOGICAL ENVIRONMENT

4.6.3.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative features include in-water work for the fishing pier extensions and several rock jetties. Some upland work is also proposed for repairs of the existing roads, parking areas, and trails. The 150-acre site is currently managed as a state park that includes numerous recreational structures and associated infrastructure, as well as natural areas of upland, wetland, and aquatic habitats. Minor, short-term effects to the marine and terrestrial habitats from construction would be erosion and sedimentation, and minor, long-term effects from placement of wooden piles and large rocks in marine environments.

In-water work associated with the fishing pier would consist of driving approximately 54 wooden piles into the nearshore marine sediments at least 15 feet deep and constructing approximately 6,400 square feet of over-water decking (400 feet long by 16 feet wide). Construction of the rock jetty extensions would place large to boulder size rocks along approximately 4,000 feet of nearshore marine habitat across five different areas around Grand Isle.

The fishing pier extension and road, parking, and trails repairs would be located within the Grand Isle State Park, which is available to the public, and would be maintained by the Louisiana Office of State Parks. No marinas or boat slips are proposed. The extension of the pier would permanently impact the shoreline area where the proposed pier is placed and would potentially impact nearby shoreline and open water areas because of increased human activities (e.g., shore-based fishing). Similarly, the extension of the rock jetties would permanently alter the nearby shoreline and open water areas where the new rock jetty areas are proposed because of the slight reduction in marine habitat from rock placement. Although these impacts would affect habitats in localized areas, the footprints of the pier and rock jetties are small and therefore, impacts would be minor but long term. Temporary disturbances from construction are expected to be minor and short term. In addition, the road, parking, and trail repairs would be limited to areas of existing infrastructure and would be unlikely to cause disturbances to surrounding natural areas. Because of management as part of the existing state park, temporarily disturbed habitats would likely be routinely monitored and would recover quickly (either naturally or through active management), and wildlife would likely use plentiful suitable habitats nearby during construction activities. Therefore, the pier and rock jetty extensions would not be anticipated to have adverse, long-term effects on terrestrial, coastal nearshore, or marine habitats beyond the small footprint of the proposed features.

One of the primary alternative goals is to promote recreational fishing; therefore, an increase in fishing pressure would result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Parking capacity would limit the total number of visitors, thereby putting an upper limit on the magnitude of fishing pressure resulting from the alternative. The use of trawl gear or gillnets within the alternative is not anticipated. Although recreational fishing would increase from current levels over the long term, it would not be expected to have substantive adverse effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. The state park currently implements trash management that includes a centralized dumpster repository as well as routine trash collection efforts. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.3.2.2 Protected Species

Protected Aquatic Species

The West Indian manatee and sea turtles have potential to be present near the alternative during alternative activities. Habitats suitable to support marine and estuarine vegetation may be present near the alternative and could attract the West Indian manatee, common bottlenose dolphin, and sea turtle species into the area. However, no known occurrences of these species have been documented within the alternative footprint (LDWF 2018; NatureServe 2016). Potential effects to these species would most likely be related to construction activities that would be minor to moderate and short term. In the unlikely event that a manatee, common bottlenose dolphin, or sea turtle moves into the area, impacts may include disturbance via noise from in-water construction activities, including impact pile driving. Increases in recreational fishing has the potential for sea turtles or other species to get caught in hook and line gear. Given the low likelihood of sea turtles entering the vicinity of the alternative, adverse

effects from hook and line gear would not be anticipated. Additionally, lighting installed on infrastructure could impact sea turtle species; however, the use of BMPs and approved lighting would minimize these effects.

Protected aquatic species in and around the alternative may be sensitive to changes in noise sources or levels because of alternative construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb fish and marine mammals, including manatee and dolphin, resulting in minor to moderate, short-term impacts. Conservation measures to protect marine mammals from noise are discussed in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A). The timing of in-water noise-producing activities would be planned to minimize disturbances to marine life. BMPs, in addition to other avoidance and mitigation measures as required by state and federal regulatory agencies, would minimize water quality impacts that could affect aquatic habitat. Although protected species are not anticipated in the alternative, these measures would minimize any adverse, minor, and short-term effects on aquatic habitats that may be used by protected aquatic species. Because protected aquatic species are either not likely to occur at the alternative or because conservation measures would be implemented, no adverse, long-term impacts to protected aquatic species are anticipated.

Protected Terrestrial Species

Piping plover and red knot, both bird species, may occur near the alternative. Both species would experience short-term, minor to moderate adverse impacts, if present during construction. Impacts to the piping plover and red knot could occur from increased activity, human presence, and construction noise during the construction activities. These impacts would be localized and short term, however. During construction, these shorebirds would likely move away from the access improvement activities to undisturbed habitat adjacent to the alternative. Once short-term impacts from construction are completed, these shorebirds would once again use suitable habitat in the alternative.

BMPs as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts (DWH Trustees 2016). Additionally, all individuals working on the alternative construction would be provided with information in support of general awareness of piping plover and red knot presence and means to avoid birds and their critical or otherwise important habitats. The proposed construction work would be avoided during peak activities for these species to the maximum extent practicable. If work must be conducted when these species are present, construction workers would avoid working near concentrations of individuals or post avoidance areas to minimize disturbance.

Critical Habitat

Although critical habitat for piping plover is present along the coastline of Grand Isle including the alternative (Unit LA-5), activities for the alternative would not occur within the PCEs for the piping plover wintering habitat. PCEs for piping plover overwintering habitat include intertidal flats and adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide. The alternative would not occur within areas that contain PCEs; therefore, although the alternative overlaps designated piping plover habitat, adverse effects would not be anticipated.

4.6.3.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative features would predominantly occur within an existing state park that has been previously developed and managed for human and natural environment land uses. Several migratory bird species have the potential to occur within the alternative. However, the alternative upland elements are proposed on previously constructed roads, parking areas, and trails and would not involve any vegetation clearing.

BMPs as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts to terrestrial wildlife and migratory birds. Therefore, adverse effects to these species would not be anticipated.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to alternative construction resulting in short-term, minor to moderate impacts. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) as necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.6.3.2.4 Marine and Estuarine Fauna

The extension of the fishing pier and rock jetties would permanently alter the shoreline area where these features are located and open water areas where structures are placed resulting in minor, long-term impacts. Increased human activities (e.g., shore-based fishing, litter) may also result in minor, long-term effects to marine and estuarine species. Although these impacts may affect aquatic fauna, fisheries, and EFH in localized areas, the footprints of the fishing pier and rock jetty extensions are small and similar to existing in-water structures, and temporary disturbances are expected to be limited in scope and duration. Temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby. Therefore, the fishing pier and rock jetties are not expected to have substantive adverse, long-term effects on aquatic fauna, local fisheries, or designated EFH.

The timing of in-water noise-producing activities would be planned to minimize disturbances to marine life. Potential impacts to estuarine and aquatic fauna, managed fisheries, and EFH would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna, EFH, and managed species, as determined necessary by the Implementing Trustee. Trash management is actively managed at the Grand Isle State Park and would minimize littering. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.3.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.3.3 SOCIOECONOMIC ENVIRONMENT

4.6.3.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have to have a "disproportionately high and adverse" effect on a minority or low-income population. Although the Jefferson Parish is a minority population that is disproportionately more low income than others in the

state, the alternative would not have a disproportionately adverse effect on these communities and, in fact would provide a net benefit to nearby communities by providing improved and increased access to recreational activities, including fishing.

4.6.3.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by car, boat, and foot to the recreational resources near the alternative. The proposed extension of the fishing pier and rock jetties, as well as the repairs to roads, parking areas, and trails, would allow anglers, wildlife viewers, and others to better reach the Gulf of Mexico and other inland waters connecting to the Gulf of Mexico. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.3.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks or other infrastructure. The alternative would improve existing infrastructure associated with recreational use by repairing existing roads, parking areas, and trails within the Grand Isle State Park and providing a new pier. Although the alternative would likely increase recreational use of the park, traffic on nearby roads would not be anticipated to increase substantially over existing conditions and would result in negligible minor effects.

4.6.3.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the fishing pier, new rock jetties, and nature trail and road improvements within Grand Isle State Park. Cultural resources surveys have been conducted near the alternative, including along the banks of Bayou Cutler/Barataria Bay Waterway (LDOA Report No. 22-0732), along the shore of Grand Isle (LDOA Report No. 22-0465), along a pipeline corridor crossing the island (LDOA Report No. 22-2531), within a dredge channel on the bay side of the island (LDOA Report No. 22-2653), and on Grand Terre Island near Fort Livingston, including within the shallow waters adjacent to the site (LDOA Report Nos. 22-4154, 22-3819, 22-3754, and 22-4402). In addition, several underwater cultural resources surveys have been conducted off shore of Grand Isle (LDOA Report Nos. 22-1438, 22-2365, 22-2716, and 22-0912).

These surveys have identified numerous cultural resources on Fifi Island, Beauregard Island, and Grand Terre Island, although no known cultural resources sites have been yet identified within Grand Isle State Park. Sites include the possible remains of a nineteenth century pirate settlement (16JE128), a shipwreck (16JE296), the remnants of historic canning and fishing operations (16JE124, 16JE28), and the ruins of Fort Livingston (16JE49), an NRHP-listed brick fort dating to the 1840s. Additionally, 13 known

shipwreck or obstruction points have been documented within the waters within a 1-mile radius of Grand Isle State Park, including one shipwreck which lies within or immediately adjacent to the proposed location of rock jetties along the east end of Grand Isle. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground- or substrate-disturbing activities under the alternative.

4.6.3.3.5 Land Use and Agricultural Resources

The alternative was acquired in 1968 by the State of Louisiana for the purpose of establishing the Grand Isle State Park. The alternative is consistent with existing land use in the area, is designated as a state park, and would not adversely affect current land use.

Agricultural lands are not present on the alternative; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.3.4 AESTHETICS AND VISUAL RESOURCES

During construction, impacts on visual resources from the alternative would be minor, short term, and adverse, primarily because of the presence of construction personnel, equipment (e.g., fences, stockpiles), vehicles, and unfinished structures visible to the public and recreational users. Construction activities could detract from the overall visual environment at the site, but these activities would be short term. Even though existing viewsheds would be temporarily affected, these impacts would not dominate the view or detract from current user activities or experiences.

Implementation of the alternative would change the current visual character of the coastal area by extending the existing Grand Isle State Park fishing pier and rock jetties along portions of Grand Isle; however, these elements would not introduce an unfamiliar aesthetic because the site currently contains a fishing pier, and the surrounding areas currently contain rock jetties. The remainder of the elements would not adversely affect the site, which primarily consists of access roads, parking lots, trails, and park support structures, because these features would largely remain the same. The alternative's elements would not be out of character with previous site conditions and use. Views of the site and the surrounding areas would not noticeably change from the implementation of the alternative.

4.6.3.5 PUBLIC HEALTH AND SAFETY

4.6.3.5.1 Noise

Noise associated with equipment during construction of the fishing pier (including placement of new piles), rock jetties, and repairs to roads, parking areas, and trails would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, pile installation, asphalt laying, grading, and rock armor placement. Implementation of the alternative would include transportation of construction materials to the alternative, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

Human communities near the alternative may be affected by noise during construction of the proposed facilities. These activities are expected to be short term. Construction noise can also be a nuisance to residents living or recreating on the shorelines adjacent to alternative construction activities. Construction activities at the site would result in short-term, minor adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, increased recreational use by visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts at the alternative from personal vehicle use, fishing, and other recreational activities would likely be minor and adverse.

4.6.3.5.2 Resiliency

The alternative includes extension of a fishing pier and rock jetties and repairs to existing roads, parking areas, and trails. The fishing pier extension addresses ongoing sedimentation at the existing pier, which negatively impacts fishing. The rock jetties would be built out of large to boulder size rocks to withstand wave forces. The existing roads and parking areas would be lifted by 2 inches to address current flooding issues and damages from previous floods. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be further determined during final design. To minimize short-term, minor, adverse impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.4 Chitimacha Boat Launch

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.4.1 PHYSICAL ENVIRONMENT

4.6.4.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include construction of the parking lots, roadways, pavilions, boat ramp, floating and wooden docks, and footpaths. Operation and maintenance of these facilities may also affect soils and substrates. Soils at the alternative include Baldwin silty clay loam, 0 to 1 percent slopes, and Uderts and Glenwild, 0 to 3 percent slopes, neither of which are highly erodible.

In-water work is expected because of the construction of the boat launch, floating dock, and wooden dock. The over-water area of the floating dock is estimated to be approximately 480 square feet, and the over-water area of the two wooden docks is estimated to be 3,360 square feet. Wooden dock construction would include placement of new treated wooden piles using a pile driver. Substrate displacement and compaction from piling installation would result. The number, size, and depth of piles for the wooden dock would be subject to final design, although it is expected that only a small area of substrate would be displaced in the marine environment. In-water work associated with the boat launch would be relatively

minor and primarily consist of the placement of concrete, sand, and crushed stone. Sidewalls would be placed along the boat launch using vinyl sheet pile installed using heavy equipment to drive it below the surface vertically along the sides of the boat ramp to prevent erosion and to provide long-term stability.

Excavation would occur along the riparian area for the docks and boat launch and in the upland environment for the parking lots for cars and trucks and trailers, access roads, pavilions, and the footpath to the pavilion and kayak launch. The depth of ground disturbance and excavation would depend on final design for the boat launch, docks, and pavilions. For the parking areas and roadways, the depth would be expected to be less than 6 inches.

Construction equipment for staging would likely include bulldozers and graders, pile driving machinery, barge(s), a bobcat, and dump trucks. Staging is anticipated to occur within the 5-acre alternative in areas proposed for facilities that would be graded. Construction of the parking areas, boat launch, docks, pavilions, and footpaths would impact soils and substrates within the footprint of each alternative feature. Roadways and footpaths have been sited to direct foot and vehicle traffic into designated areas, minimizing short-term, minor, adverse impacts to the overall site.

Short-term, minor disturbances to terrestrial soils and substrates would occur on-site from construction and site preparation activities. However, the impacts would be localized to several small areas across the alternative. Because the site is currently undeveloped, areas proposed for alternative features would permanently convert existing soils resulting in minor, long-term impacts. It is anticipated that areas not necessary for complete buildout of the Chitimacha Boat Launch and associated facilities may be disturbed during construction. Excavated soils would be stockpiled on-site in order to reclaim and revegetate areas disturbed but not needed for alternative features.

4.6.4.1.2 Hydrology and Water Quality

The alternative includes in-water work for construction of the boat launch and docks. Additionally, ground disturbance as a result of excavation and grading during construction could result in sedimentation entering the surrounding waterway. These effects would be minor, short-term and localized and would conclude once construction is completed. The introduction of impervious surface and use of gravel parking areas and roadways may increase sedimentation and stormwater runoff into the receiving water body. These effects to water quality and hydrology would be long term, but minor due to the small size of the alternative. Users of the boat launch have the potential to increase the release of fuel and other effluents into the receiving water body. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.4.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, cranes, small barges with crane, small excavators, fork lifts, roller, generators, small trucks, pile drivers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use that may result from a larger parking area for cars and trailers, the potential increase in emissions would be nominal.

4.6.4.2 BIOLOGICAL ENVIRONMENT

4.6.4.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative features under consideration include upland-based items such as road, parking area, footpath, and pavilion construction. Some in-water work is also proposed for construction of the boat launch and docks. The 5-acre site is currently undeveloped, and alternative activities would take place in undisturbed natural upland, wetland, or aquatic habitats. The primary impacts to the environment would be through the short-term effects of construction, including potential erosion and sedimentation.

In-water work associated with the boat launch would consist of placing concrete, sand, and crushed stone, as well as vinyl sheet pile in the waterway. Construction of the floating dock would require removal of vegetation along the shoreline and anchorage to the river bottom substrate. The wooden dock would require the driving of piles into the substrate for support.

The creation of the small boat launch would permanently impact the shoreline area where the ramp and docks are placed and would potentially impact nearby shoreline and open water areas because of increased human activities (e.g., boat traffic, litter). Although these impacts would affect habitats in localized areas in the long term, the footprints of the ramp and docks are small, and temporary disturbances are expected to be limited in scope and duration resulting in minor effects. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities. Therefore, the boat launch and dock would not be anticipated to have adverse, major, long-term effects on terrestrial, coastal nearshore, or marine habitats.

One of the primary alternative goals is to promote recreational fishing; therefore, an increase in fishing pressure would result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Parking capacity would limit the total number of visitors, thereby putting an upper limit on the magnitude of fishing pressure resulting from the alternative. The use of trawl gear or gillnets within the alternative is not expected. Although recreational fishing would increase from current levels in the long term, the increase is expected to be minor and unlikely to have substantive adverse effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. Trash management would include a centralized dumpster repository as well as routine trash collection efforts. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.4.2.2 Protected Species

Protected Aquatic Species

The alternative features would require in-water work within Bayou Teche. One protected aquatic species, the West Indian manatee, could occur in the alternative, although the presence of the species is unlikely. Sightings of manatees in Louisiana riverine and estuarine habitats are rare and are more likely to occur in areas where submerged or emergent aquatic vegetation is available for forage (LDWF 2018). The West Indian manatee occurs in warm shallow estuarine waters adjacent to a freshwater source and with seagrass or other submerged or emergent vegetation for forage. No large beds of SAV occur within the alternative (Love et al. 2013; NOAA 2018). In the unlikely event that a manatee moves into the Bayou Teche within the alternative, impacts may include disturbance via noise from in-water construction activities, including impact pile driving.

Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb fish and marine mammals resulting in minor to moderate, short-term impacts. Conservation measures to protect marine mammals from noise are discussed in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A). The timing of in-water noise-producing activities would be planned to minimize disturbances to marine life. BMPs, in addition to other avoidance and mitigation measures required by state and federal regulatory agencies, would minimize water quality impacts that could affect aquatic habitat.

Although protected species are not anticipated in the alternative, these measures would minimize any short-term, minor, adverse effects to aquatic habitats that may be used by protected aquatic species. Because protected aquatic species are not likely to occur in the alternative, and because conservation measures would be implemented, no adverse, long-term impacts to protected aquatic species are anticipated.

Protected Terrestrial Species

The following protected terrestrial species may occur in St. Mary Parish: piping plover and red knot. The alternative does not contain suitable habitat for either of these species, which require intertidal beaches/mud flats with no or very sparse vegetation for the piping plover and barrier island systems for the red knot. Individuals may occur at the alternative during migration and if present, minor to moderate, short-term effects would occur during construction. During construction, shorebirds would likely move to undisturbed habitat adjacent to the alternative. Once short-term impacts from construction cease, these shorebirds would once again use suitable habitat in the alternative.

Critical Habitat

No critical habitats for protected species have been identified as occurring in the alternative (USFWS 2018); therefore, the alternative would not be expected to have adverse impacts to designated critical habitat.

4.6.4.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative features would occur within a 5-acre undeveloped site and therefore may affect terrestrial wildlife. Some of the 5-acre site would be permanently converted from undeveloped vegetated areas to gravel parking areas, roadways, and footpaths. Potential effects from construction of these features include removal of foraging, nesting, or other habitat; disturbance from noise during and after construction; and erosion and sedimentation of aquatic areas near construction that terrestrial species rely on for foraging or resting.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to alternative construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds resulting in minor to moderate short-term effects. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions, although the site's proximity to waterway traffic may render these increases negligible. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.6.4.2.4 Marine and Estuarine Fauna

In-water work associated with the boat launch would consist of placing concrete, sand, and crushed stone as well as vinyl sheet pile in the waterway. Construction of the floating dock would require removal of vegetation along the shoreline and anchorage to the river bottom substrate. The wooden dock would require the driving piles into the substrate.

The creation of the boat launch and docks would permanently alter the shoreline and open water areas where the ramp and docks are placed and would likely increase minor, long-term impacts to nearby shoreline and open water areas because of increased human activities (e.g., boat traffic, litter). Although these impacts may affect aquatic fauna and fisheries in localized areas, the footprints of the ramp and docks are small, and disturbances are expected to be minor because of the limited scope. Temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby. Designated EFH does not occur near the alternative.

4.6.4.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.4.3 SOCIOECONOMIC ENVIRONMENT

4.6.4.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have to have a "disproportionately high and adverse" effect on a minority or low-income population. Although the Chitimacha Tribal community is a minority population that is disproportionately more low-income than elsewhere in the state, as is St. Mary Parish, the alternative would not have a disproportionately adverse effect to the community and in fact would provide a net benefit to the Chitimacha community by providing improved and increased access to recreational activities, including fishing.

4.6.4.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by car, boat, and foot to the recreational resources near the alternative and the Chitimacha Tribal community. The proposed construction of boat launch, parking areas, docks, and pavilions would allow anglers, wildlife viewers, and others to better reach Bayou Teche and other waterways connecting to the Gulf of Mexico. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.4.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve infrastructure associated with recreational use by providing a new boat launch with increased parking areas as well as docks, footpaths, and pavilions for passive recreation and wildlife viewing. Although the alternative would provide more parking and access than the existing boat ramp that would be closed after the alternative is completed, traffic on nearby roads would not be anticipated to increase substantially over existing conditions and would result in negligible minor effects.

4.6.4.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the boat launch and parking lot at the Chitimacha Boat Launch. One cultural resources survey covers a portion of the alternative (LDOA Report No. 22-0105). This investigation focused on resources along the bank of Bayou Teche and was conducted by boat (Gibson et al. 1975). A second survey was conducted within Tribal Lands immediately adjacent to the alternative (LDOA Report No. 22-3053). No cultural resources have been identified within the immediate footprint of the alternative. The cultural resources survey immediately adjacent to the site identified a historic archaeological site (16SMY192) whose boundary appears to artificially terminate at the property boundary, suggesting that historic cultural resources may be present within the alternative. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.4.3.5 Land Use and Agricultural Resources

The alternative was acquired in 2009 by the Chitimacha Tribe for the purpose of installing a new boat launch and associated facilities. It is consistent with existing land use in the area and would not adversely affect current land use.

Agricultural lands are not present on the alternative; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.4.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve construction of recreational facilities such as a boat launch, parking area, access road, and docks. During construction, impacts on visual resources from the alternative would be adverse, minor, and short term primarily because of the presence of construction personnel, equipment (e.g., fences, stockpiles), vehicles, and unfinished structures visible to the public. Although the new boat launch and associated facilities would be seen from adjacent public roads and recreational navigators of Bayou Teche, it would improve accessibility to Bayou Teche and many other waterways in the area, which would improve access to those visual resources.

Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. Impacts from construction may be adverse, but localized, minor, and short term. Long-term impacts would be beneficial because improvements would enhance accessibility to visual resources.

4.6.4.5 PUBLIC HEALTH AND SAFETY

4.6.4.5.1 Noise

Noise associated with equipment during construction of the docks (including placement of new piles), boat launch, parking areas, roadways, pavilions, and footpaths would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, preparing the site, pile installation, placing foundations, grading, and fill placement. Implementation of the alternative would include transportation of construction materials to the alternative, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

Human communities near the alternative may be affected by noise during construction of the proposed facilities. These activities are expected to be short term. Construction noise can also be a nuisance to residents living or recreating on the shorelines adjacent to alternative construction activities. Construction activities at the site would result in short-term, minor, adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts at the alternative from personal vehicle use, boating, fishing, and other recreational activities would likely be adverse but minor.

4.6.4.5.2 Resiliency

The alternative includes construction of a boat ramp, wooden dock, and floating dock. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design. To minimize short-term, minor, adverse impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.5 Sam Houston Jones State Park Improvements

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.5.1 PHYSICAL ENVIRONMENT

4.6.5.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include the replacement of the trailer cabins and construction of a new restroom facility. Operation and maintenance of these facilities may also affect soils and substrates. Soils at the alternative include Baldwin silty clay loam, 0 to 1 percent slopes, and Uderts and Glenwild, 0 to 3 percent slopes, and neither are highly erodible.

Excavation would occur at the locations of the existing trailer cabins and the new restroom facility entirely in upland areas, and would likely include extensions of existing underground park utilities. The depth of ground disturbance and excavation would depend on final design for these structures, but is expected to be similar to that of existing cabins and restroom facilities within the park.

Construction equipment for staging would likely include bulldozers and graders, a bobcat, and dump trucks. Staging is anticipated to occur within the Sam Houston Jones State Park on existing parking areas. Construction of the replacement cabins and new restroom facility would result in minor, long-term impacts to soils within the footprint of each alternative feature. Existing roadways and footpaths would be used to direct foot and vehicle traffic into designated areas, minimizing adverse impacts to the overall site during and after construction.

Short- and long-term minor disturbances to terrestrial soils and substrates would occur on-site from construction and site preparation activities. However, the impacts would be localized to several small areas across the alternative and are co-located with existing park infrastructure. Excavated soils would be stockpiled on-site in order to reclaim and revegetate areas disturbed but not needed for alternative features.

4.6.5.1.2 Hydrology and Water Quality

Ground disturbance as a result of demolition of existing trailer cabins, construction of replacement cabins, and construction of a new restroom facility would include some excavation and grading during site preparation and could result in sedimentation entering the surrounding waterway. The alternative would implement the hydrology and water quality BMPs described in Section 4.3.1 to avoid and minimize potential effects to receiving water bodies. However, these minor effects would be short term and localized and would conclude once construction is completed. Additional impervious surface would be added to the site of the new restroom facility (750 square feet) and effects from this small area of impervious surface would be negligible in the setting of the state park. These effects would also be minimal due to the small size of the alternative. Human waste from the new and renovated restroom facilities would be managed within the existing park waste management infrastructure. The alternative does not include any in-water work. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.5.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, cranes, small excavators, fork lifts, roller, generators, small trucks, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use that may result, the potential increase in emissions would be nominal.

4.6.5.2 BIOLOGICAL ENVIRONMENT

4.6.5.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative features under consideration include upland-based items such as restroom renovations and construction of replacement cabins and a new restroom. No in-water work is proposed for the alternative. The 1,087-acre site is currently managed as a state park that includes numerous recreational structures and associated infrastructure, as well as natural areas, including upland, wetland, and aquatic habitats. The primary impacts to the environment would be through the short-term effects of construction, including potential erosion and sedimentation.

The restroom renovations and construction of replacement cabins and a new restroom would be located within the Sam Houston Jones State Park, which is available to the public, and would be maintained by the Louisiana Office of State Parks. No marinas or boat slips are proposed. The proposed restroom renovations and replacement cabins would be limited to areas of existing infrastructure and would be

unlikely to cause disturbances to surrounding undisturbed natural areas. The proposed new restroom would likely have short-term, minor effects to terrestrial habitats but would be located adjacent to other park amenities. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities. Therefore, the proposed new restroom would not be anticipated to have adverse, long-term effects on terrestrial habitats.

One of the primary alternative goals is to improve recreational fishing experiences; therefore, an increase in fishing pressure would likely result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Parking capacity would limit the total number of visitors, thereby putting an upper limit on the magnitude of fishing pressure from the park's boat launch resulting from the alternative's park infrastructure improvements. The use of trawl gear or gillnets within the alternative is not expected. Although recreational fishing would increase from current levels, it is not expected to have substantive adverse effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. The state park currently implements trash management that includes a centralized dumpster repository as well as routine trash collection efforts. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.5.2.2 Protected Species

Protected Aquatic Species

The alternative would not include any in-water work and would be limited to uplands. The proposed work does not occur in habitat that is optimal for the protected species that may occur in Calcasieu Parish. Due to lack of suitable marine, estuarine, and riverine habitat in the alternative, protected aquatic protected species are unlikely to be present, therefore effects to protected aquatic species would not be anticipated.

Protected Terrestrial Species

All of the proposed construction associated with the alternative would occur in uplands within the existing 1,087-acre Sam Houston Jones State Park. The red-cockaded woodpecker may occur in Calcasieu Parish; however, the alternative would not occur in habitat that is optimal for the protected species. Due to lack of suitable habitat in the alternative, the red-cockaded woodpecker is unlikely to be present, therefore effects to red-cockaded woodpeckers would not be anticipated.

Critical Habitat

There is no designated critical habitat within Calcasieu Parish. No effects to critical habitat would occur as a result of the alternative.

4.6.5.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative features would occur within the existing state park, which has been previously developed and managed for human and natural environment land uses. Several migratory bird species have the potential to occur within the alternative. However, the alternative elements would only occur within the footprint of existing infrastructure or in areas directly adjacent to park infrastructure, such as roads, trails, or campsites. Vegetation clearing is unlikely to occur and would be determined during E&D. If any vegetation clearing becomes necessary, best practices as described in the Final PDARP/PEIS

(DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts to terrestrial wildlife and migratory birds. Therefore, adverse effects to these species would not be anticipated.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, bulldozers) is known to disturb migratory birds. These effects during construction would be minor and short term. Although a slight increase in recreational use of the park could result in a slight increase in long-term noise levels, these noise levels would be very similar to the baseline conditions and would be considered negligible. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction.

4.6.5.2.4 Marine and Estuarine Fauna

The alternative would not include any in-water work and would be limited to uplands. Therefore, due to lack of nearby coastal or marine habitats, effects to species in these habitats would not be anticipated. Trash management is actively managed at the Sam Houston Jones State Park and would minimize littering. The alternative is not located within designated EFH and would have no effect on EFH.

4.6.5.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.5.3 SOCIOECONOMIC ENVIRONMENT

4.6.5.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have to have a "disproportionately high and adverse" effect on a minority or low-income population. Calcasieu Parish is not considered a minority population compared to elsewhere in the state; therefore, the alternative would not have a disproportionately adverse effect to minority or low-income communities. The alternative would provide a net benefit to nearby communities by providing improved and increased access to recreational activities, including fishing.

4.6.5.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by car, boat, and foot to the recreational resources near the alternative. The proposed park facility improvements would allow anglers, wildlife viewers, and others to better reach Calcasieu West Fork River and other waterways connecting to the Gulf of Mexico. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.5.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve existing infrastructure associated with recreational use by renovating existing restrooms, replacing old cabins, and constructing a new restroom within the Sam Houston Jones State Park. Although the alternative would likely increase recreational use of the park, traffic on nearby roads would not be anticipated to increase substantially over existing conditions and would result in long-term, negligible to minor effects.

4.6.5.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing alternative-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the new campground improvements and of Sam Houston Jones State Park. No intensive cultural resources surveys have been conducted within Sam Houston Jones State Park; however, at least two general archaeological assessments have been conducted of resources within the park (LDOA Report Nos. 22-3643 and 22-2913) (Barr 2017). At least three previously recorded cultural resources have been identified in the park: the remains of the historic West Fork community (16CU94), Kneeland's Ferry East Landing (16CU93), and a Late Prehistoric occupation at the Moss Bluff Site (16CU142). This last archaeological site is located within the picnic area on the east end of the alternative, and may be impacted by parking lot improvements or construction on the picnic pavilion. A cultural resources survey would likely be required for the completion of the alternative. The alternative includes ground-disturbing activities for new cabins, restroom, walkway, and utility service locations, and potentially parking lot improvements if the depth of impact extends beneath the currently impacted area of the parking lot. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.5.3.5 Land Use and Agricultural Resources

The alternative was acquired in 1944 by the State of Louisiana for the purpose of establishing the Sam Houston Jones State Park. The alternative is consistent with existing land use in the area, is designated as a state park, and would not adversely affect current land use.

Agricultural lands are not present in the alternative; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.5.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve improvements to the existing campgrounds, which would have a minor benefit to aesthetics of the park. During construction, impacts on visual resources from the alternative would be adverse, minor, and short term primarily because of the presence of construction personnel,

equipment (e.g., fences, stockpiles), vehicles, and unfinished structures visible to the public. Even though existing viewsheds would be temporarily affected, these impacts would not dominate the view or detract from current user activities or experiences.

Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. Overall, impacts from construction may be adverse, but localized, minor, and short term. No effects to the surrounding visual resources would be anticipated from the alternative. Overall, long-term impacts would be beneficial because improvements would enhance campground aesthetics.

4.6.5.5 PUBLIC HEALTH AND SAFETY

4.6.5.5.1 Noise

Noise associated with equipment during construction of the replacement cabins, new restroom, and renovations of existing restroom facilities would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, preparing the site, placing foundations, grading, and fill placement. Implementation of the alternative would include transportation of construction materials to the alternative, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

Human communities near the alternative may be affected by noise during construction of the proposed facilities. These activities are expected to be short term. Construction noise can also be a nuisance to residents living or recreating on the shorelines adjacent to alternative construction activities. Construction activities at the site would result in short-term, minor, adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, increased recreational use by visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts at the alternative from personal vehicle use, fishing, and other recreational activities would likely be minor.

4.6.5.5.2 Resiliency

The alternative includes construction of the replacement cabins, new restroom, and renovations of existing restroom facilities, all located in uplands. As necessary, resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design. To minimize long-term minor impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.6 Pointe-aux-Chenes Wildlife Management Area Recreational Use Enhancement

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.6.1 PHYSICAL ENVIRONMENT

4.6.6.1.1 Geology and Substrates

Alternative activities are not anticipated to noticeably affect the overall surficial geology in the Point-aux-Chenes WMA. However, aspects that may affect soils and substrates include construction of the parking lots, an access road, a boat launch renovation, and pilings used for piers and docks. Operation and maintenance of these facilities may also affect soils and substrates. Soils in the alternative are part of the Lafitte-Clovelly association, which are found in marshes and on delta plains and have slopes approaching 0 degrees. These soils are typically very poorly drained histosols. The erodibility of soils from this association is not rated.

Minor, long-term impacts to substrates from in-water work are expected at multiple locations, where wooden pilings would be driven for piers, docks, and boat launches, which would result in substrate displacement and compaction from the pilings. Pilings would likely be driven from floating barge-mounted equipment that is not expected to impact substrates. The total number of pilings would be subject to final design, although most pilings are expected to be 30 feet long by 12 inches wide, and would displace an amount of substrate equal to the length of the piling driven below the existing grade. Dredging near the Island Road boat launch would result in short-term, minor impacts to approximately 3,000 linear feet of substrate approximately 40 feet wide along the Island road. Other impacts to substrate from in-water work would be long term but minor and include placement of concrete boat launch panels on the existing substrate, and driving new sheet pile next to the existing sheet pile at the Island Road boat launch.

Excavation in upland and shoreline areas that could result in long-term minor effects to soils and would occur in discrete areas where piers, docks, and the boat launch intersect the shoreline. Soils would also be temporarily impacted during the clearing and grading required for the pirogue launch and pullovers, installation of articulated concrete block walkways, as well as development of parking areas and the access road. Placement of features would permanently alter soils and substrates within the footprint of the features resulting in short- and long-term minor effects. The total area of soil disturbance and disturbance depths would be determined during final design. Standard earth moving equipment such as bulldozers, graders, pile driving machinery, excavators, and dump trucks would be used in upland and shoreline areas depending upon site conditions. Access roads and parking areas, and other facilities have been sited to direct foot and vehicle traffic into designated areas, minimizing adverse impacts to the alternative.

Short- and long-term minor disturbances to terrestrial soils and substrates would occur on-site from construction activities. However, the impacts would be localized to several discrete and relatively small areas across the WMA. Equipment staging and material stockpiling would likely occur temporarily at or adjacent to the alternative elements. Impacts to soils in these temporary use areas would be minor and short term. Where practicable, excavated soils would be stockpiled on-site in order to reclaim and revegetate disturbed areas not needed for alternative development.

4.6.6.1.2 Hydrology and Water Quality

In-water work that may affect water quality associated with the alternative primarily includes installation of timber pilings, boat launch construction, dredging, and sheet pile installation. Upland and shoreline work that may affect water quality includes clearing, grading, and backfilling associated chiefly with the pirogue launch access road and new parking lot, pier and dock walkways connecting to the shoreline, and articulated concrete block walkway installations. These activities could impact water quality by introducing sediment into the water and increasing turbidity. Alternative activities with the potential to impact hydrology include dredging near the Island Road boat launch. The alternative would implement hydrology and water quality BMPs described in Section 4.3.1 to avoid and minimize potential effects to receiving water bodies. Impacts to hydrology would be localized and long term, but relatively minor because of the small size of the alternative. Impacts to water quality would occur during construction and would be localized and short term. Impacts to water quality from any permanent increase in stormwater from impervious surfaces would be long term but minor. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during final design.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. SWPPPs would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.6.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative would include use of standard construction and earth moving equipment such as bulldozers, excavators, trucks, backhoes, cranes, barges, fork lifts, generators, and pile drivers. During construction, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Impacts to air quality would be expected to be localized, and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term, and would not require a detailed assessment. Long-term impacts could include an increase in emissions from the increased recreational use from new motorists at the pirogue launch parking area, and a potential increased motorist and boating users at the improved alternative facilities. These impacts would be relatively minor when compared to the exhaust produced by existing recreational motorists and boaters, and are not expected to cause an exceedance of the NAAQS.

4.6.6.2 BIOLOGICAL ENVIRONMENT

4.6.6.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative includes permanent terrestrial (upland) elements such as a new access road and parking area, a boat launch renovation, and several docks and piers with articulated block walkways. Construction in upland areas would occur primarily along the shoreline, where dense riparian vegetation grows in undisturbed areas; however, in several locations, e.g., the Island Road boat launch, there are disturbed areas with little existing vegetation. Upland vegetation would be removed to the minimum extent necessary to construct the alternative. Construction impacts to upland habitats would be minor and short term. For most of the alternative, construction activities would require areas of temporary disturbance for equipment staging or material stockpiling. These temporary workspaces would be located in upland areas, and vegetation in these areas would be temporarily disturbed during construction.

In-water work proposed for construction at the alternative would include installation of timber pilings and construction of associate docks and piers, as well as dredging and sheet pile installation. In-water work would occur in relatively shallow estuarine and wetland habitats. Construction of these features could impact aquatic vegetation resulting in minor, short-term impacts. The amount of aquatic vegetation impacted through removal or temporary disturbance would be determined during final design. Aquatic vegetation would be removed to the minimum extent necessary to construct the alternative. Impacts to aquatic habitats from placement of features are expected to be long term, but minor when compared to the relatively large area of existing in-water habitats in the area.

One of the primary goals of the alternative is to promote recreational fishing; therefore, it would foster an increase in fishing. Increased fishing pressure would likely result in an increase in the use, and potential loss, of hook and line gear and other small fishing gear. In some cases such as the pirogue launch, parking capacity would limit the total number of visitors, thereby putting an upper limit on the magnitude of fishing pressure resulting from the alternative. Although recreational fishing would increase from current levels, it is not expected to have long-term substantive adverse effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.6.2.2 Protected Species

Protected Aquatic Species

The alternative includes in-water work for construction at various locations for the installation of timber pilings and construction of associate docks and piers, as well as dredging and sheet pile installation. Habitats suitable to support marine vegetation may be present within the alternative that could attract the West Indian manatee, common bottlenose dolphin, green sea turtle, hawksbill sea turtle, Kemp's Ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle into the area. However, no known occurrences of these species have been documented near the alternative (LDWF 2018; NatureServe 2016). In the unlikely event that these species move into the area, short-term, minor to moderate impacts would include disturbances due to in-water construction work (e.g., pile driving, turbidity, and potential strikes to individual animals). Fishing activities and waste materials associated with fishing such as hooks and fishing line could result in adverse, long-term effects. Because these species are unlikely to be present near the alternative, these effects would not be anticipated.

Protected aquatic species in and around the alternative may be sensitive to changes in noise sources or levels related to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb fish and marine mammals resulting in short-term, minor to moderate effects. Conservation measures to protect marine mammals from noise are discussed in the Final PDARP/PEIS BMPs (DWH Trustees 2016:Section 6, Appendix A). The timing of in-water noise-producing activities would be planned to minimize disturbances to marine life. BMPs, in addition to other avoidance and mitigation measures required by state and federal regulatory agencies, would minimize water quality impacts that could affect aquatic habitat. Although protected species are not anticipated in the alternative, these measures would minimize any short-term, minor to moderate, adverse effects to aquatic habitats that may be used by protected aquatic species. Because protected aquatic species are not likely to occur in the alternative, and because conservation measures would be implemented, no adverse, long-term impacts to protected aquatic species are anticipated.

Protected Terrestrial Species

Suitable habitat for the piping plover and red knot are present within the alternative. The species could use habitats within the alternative for foraging and roosting. Effects to the piping plover and red knot could occur from increased human activity and construction noise along shorelines. These impacts would be localized and short term. If the piping plover or red knot are present during construction, the shorebirds would likely move to undisturbed habitat adjacent to the alternative. Once short-term, minor to moderate impacts from construction are completed, the shorebirds could return to suitable habitat in the area. Shoreline habitat modification within the small footprints of recreational improvements would occur throughout the large WMA.

Protected terrestrial species in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb shorebirds resulting in short-term, minor to moderate impacts. If necessary, best practices as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts (DWH Trustees 2016). Additionally, all individuals working on the alternative construction would be provided with information in support of general awareness of piping plover and red knot presence and the means to avoid birds and their critical or otherwise important habitats. If work must be conducted when these species are present, construction workers would avoid working near concentrations of individuals or post avoidance areas to minimize disturbance.

Critical Habitat

No critical habitats for protected species is located near the alternative. Therefore, the alternative would not be expected to have adverse effects on designated critical habitat.

4.6.6.2.3 Terrestrial Wildlife, including Migratory Birds

Elements of the alternative such as the pirogue launch parking area and access road, pirogue pullovers, articulated concrete block walkways, and renovated boat launch would occur within terrestrial (upland) areas and result in minor, long-term effects to terrestrial wildlife and migratory birds. Potential short-term, minor to moderate effects from construction include removal of foraging, nesting, or other habitat; disturbance from noise during and after construction; and erosion and sedimentation of aquatic areas near construction that terrestrial species rely on for foraging or resting.

Terrestrial wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to alternative construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions, although the site's proximity to waterway traffic may render these increases negligible. As previously discussed, the alternative would include the BMPs described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of alternative design to avoid and minimize effects to species would be conducted prior to construction. Potential adverse impacts to wildlife would be minor and short term.

4.6.6.2.4 Marine and Estuarine Fauna

In-water work proposed for construction at various alternative features would include installation of timber pilings and construction of associated docks and piers, as well as dredging and sheet pile installation. In-water work would occur in relatively shallow estuarine and wetland habitats. Construction of these features could impact aquatic habitats used by marine and estuarine fauna. Recreational use may increase long-term impacts to nearby shoreline and open water areas as a result of increased human

activities (e.g., boat traffic, litter). Although these impacts may affect aquatic fauna and habitats in localized areas, the impacts would be minor and short term based on the availability of nearby aquatic habitats for coastal nearshore and marine species. Temporarily disturbed nearshore and marine species would likely find refuge in plentiful suitable habitats nearby. There is no designated EFH within or adjacent to the alternative and therefore no effects to EFH would occur.

The timing of in-water noise-producing activities would be planned to minimize disturbances to marine life. Potential impacts to estuarine and aquatic fauna and managed fisheries would be avoided or minimized to the extent practicable during design and construction. When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna and managed species, as determined necessary by the Implementing Trustee. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.6.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.6.3 SOCIOECONOMIC ENVIRONMENT

4.6.6.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, environmental justice concerns could arise if the alternative would have to have a "disproportionately high and adverse" effect on a minority or low-income population. The alternative is located in the parishes of Terrebonne and Lafourche, which both contain minority and low-income populations. However, alternative activities are not expected to have a disproportionately high adverse effect on these populations. The alternative intent is to provide a net recreational benefit to the communities near the Point-aux-Chenes WMA and surrounding region.

4.6.6.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The Pointe-aux-Chenes WMA is a popular destination for recreational fishing, hunting boating, birdwatching, photography, etc., receiving approximately 30,000 recreational visitors annually.

The alternative includes a new pirogue launch, pirogue pullovers, a boat launch renovation, and new fishing piers. The alternative would serve to further enhance public access by motorists and boaters to participate in these recreational activities in the WMA and waterways connecting to the Gulf of Mexico. Effects on tourism and recreational use from the alternative would be beneficial and long term.

4.6.6.3.3 Infrastructure

Impacts to existing infrastructure from implementation of the alternative would be minor and short term, occurring only during construction. These impacts could include minor, short-term traffic delays along the Island Road during boat launch construction, and minor delays in a residential portion of Montegut during construction of the pirogue launch facility. The alternative would provide additional parking and access facilities in Montegut which could create a long-term benefit to WMA infrastructure. Other alternative facilities are not anticipated to impact public infrastructure or traffic patterns.

4.6.6.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of each of the alternative elements and of the Pointe-aux-Chenes WMA. Three cultural resource reconnaissance or assessment surveys have been conducted within the alternative (LDOA Report Nos. 22-3291, 22-0359, and 22-2133-1). No intensive cultural resources investigations have occurred within Pointe-aux-Chenes WMA. In addition, no previously recorded cultural resources have been identified in the immediate area. According to USGS topographic maps, the levees in the Pointe-aux-Chenes WMA were not constructed until after 1980, meaning that no intact historic properties could exist on the levees. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.6.3.5 Land Use and Agricultural Resources

Lands proposed for use in implementing the alternative are under the management of LDWF for recreational uses. The alternative would not affect existing land uses. Agricultural lands are not present; therefore, there would be no impacts to agricultural resources from the alternative. The property is owned by LDWF and another private landowner. Landowner permission has been granted to LDWF for construction of the alternative on LDWF-leased property.

4.6.6.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve the improvement of one existing boat launch and construction of several new fishing piers and pirogue launches. Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. Impacts from construction may be adverse, but localized, minor, and short term. Long-term impacts would be beneficial, as improvements would enhance accessibility to visual resources.

4.6.6.5 PUBLIC HEALTH AND SAFETY

4.6.6.5.1 Noise

Alternative construction would result in localized noise associated with equipment use. Pier and dock construction would include pile driving. Large equipment such as excavators, backhoes, and trucks would also be used at all alternative locations. These activities would result in short-term noise impacts. Construction activities planned for alternative locations would typically include mobilizing equipment, clearing and grading, pile installation, placing foundations, grading, and fill placement. Implementation of the alternative would include transportation of construction materials to the alternative, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

Communities near the alternative including Montegut, as well as nearby residents in unincorporated areas, may be affected by noise during construction of the proposed facilities. Construction noise can also be a nuisance to recreational users adjacent to alternative construction activities. Construction activities are expected to result in minor, short-term, adverse noise impacts near the alternative and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts. After construction, when the alternative is being used, sensitive receptors may experience occasional noise associated with users at newly constructed alternative features. Overall, long-term noise impacts associated with the alternative from personal vehicle use, boating, fishing, and other recreational activities would likely be minor.

4.6.6.5.2 Resiliency

The alternative includes construction of piers and docks, a pirogue launch and pullovers, and a renovated boat ramp. The resiliency of these structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design; however, to minimize adverse, minor, long-term impacts, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided to the extent practicable.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.

Construction activities may temporarily impact the public health and safety at active alternative construction sites.

4.6.7 WHARF Phase 1

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.7.1 PHYSICAL ENVIRONMENT

4.6.7.1.1 Geology and Substrates

Aspects of the alternative that have environmental consequences for the geology and substrates include construction of restrooms, a boardwalk, and fishing piers. Soils at the alternative include Barbary muck, 0 to 1 percent slope, and Schriever clay, 0 to 1 percent slope; neither are highly erodible.

In-water work is expected due to the construction of an elevated boardwalk and fishing piers. Boardwalk construction would include placement of new pilings using the least invasive techniques, given substrate and construction cost considerations (e.g., jetting, pushing, or driving the piles). In-water dredging or digging associated with installation of the pilings for the boardwalk is not anticipated, though substrate displacement and compaction from piling installation is expected. The number, size, and depth of pilings for each structure would be subject to final design. In-water work is expected to be relatively minor and short term. Placement of these feature would convert soils and substrates, permanently resulting in minor, long-term effects.

Excavation would occur along the riparian area for the boardwalk, fishing piers, and in the upland and wetland terrestrial environment for the restroom facilities. The depth of ground disturbance and excavation would depend on final design.

Digging would occur in the terrestrial environment to auger holes and/or excavate for foundations for the elevated boardwalk and fishing piers at land tie-ins, as needed. Additional ground disturbances and surficial digging would be associated with construction of restroom facilities and light poles, as well as excavation and backfilling of remnant concrete foundations. The depth of disturbance for excavating the existing concrete foundations depends on the depth of those foundations.

Construction equipment and materials have not been identified but likely include bulldozers and graders, pile driving machinery, barge(s), a bobcat, and dump trucks. Staging of equipment and materials would likely be located on-site at the proposed parking areas or on previously disturbed sites. Although the boardwalk, fishing piers, and restroom facilities would impact soils, these improvements would direct and condense foot and vehicle traffic into designated areas, minimizing short-term, minor impacts to the overall site.

Short- and long-term minor disturbances to terrestrial soils and substrates would occur on-site from construction and site preparation activities. However, the impacts would be localized to several smaller areas across the alternative. Because the site was previously developed, allowing spaces for initial construction staging, it is anticipated that areas outside of the alternative footprint would not be disturbed during construction. Excavated soils would be stockpiled on-site in order to reclaim and revegetate areas disturbed but not needed for alternative features.

4.6.7.1.2 Hydrology and Water Quality

A jurisdictional determination provided by USACE in 2014 identified most of the alternative as wetland, subject to CWA Section 404 and Rivers and Harbors Act Section 10 permitting (USACE 2014). The alternative includes in-water work for construction of the boardwalk and fishing piers. Additionally, ground disturbance as a result of excavation and grading during construction could result in sediment entering the surrounding waterway. The alternative would implement hydrology and water quality BMPs described in Section 4.3.1 to avoid and minimize potential effects to receiving water bodies. However, these effects would be minor, short term, and localized and would conclude once construction is completed. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.7.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, cranes, small barges with cranes, small excavators, fork lifts, rollers, generators, small trucks, pile drivers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a slight increase in emissions from the increase in recreational use of the site; however, the potential increase in emissions would be nominal.

4.6.7.2 BIOLOGICAL ENVIRONMENT

4.6.7.2.1 Terrestrial, Coastal-Nearshore, and Marine Habitats

The alternative features under consideration include upland-based items such as restroom construction and light pole installations. In-water work is also proposed for construction of the boardwalk and fishing piers. The alternative is at an abandoned airport, and activities would take place in partially disturbed and naturally vegetated upland, wetland, and aquatic habitats. The primary impacts to the environment would be through the short-term effects of construction, including vegetation removal as well as potential erosion and sedimentation.

The creation of the boardwalk and fishing piers would permanently impact the shoreline area where the recreation enhancements are placed and would potentially impact nearby shoreline and open water areas because of increased human activities (e.g., boat traffic, litter) and vegetation removal. Although these impacts would affect habitats in localized areas, the footprints of the boardwalk and fishing piers would be the minimum size necessary to provide safe public access to the water. Temporary disturbances from construction activities would be expected to be limited in scope and duration resulting in short-term, minor impacts. Temporarily disturbed habitats would likely be routinely monitored and would recover quickly (either naturally or through active management), and wildlife would likely use available suitable habitats nearby. Therefore, the alternative would not be anticipated to have adverse, long-term effects on terrestrial, coastal nearshore, or marine habitats.

One of the primary alternative goals is to promote recreational fishing; therefore, an increase in fishing pressure would result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Parking capacity would limit the total number of visitors, thereby putting an upper limit on the magnitude of fishing pressure resulting from the alternative. The use of trawl gear or gillnets within the alternative is not expected. Although recreational fishing would increase from current levels, it is not expected to have long-term, substantive, adverse effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.7.2.2 Protected Species

Protected Aquatic Species

The alternative features would require in-water work within Dugues Canal and the enclosed fishing area within the WHARF site. One protected aquatic species, the West Indian manatee, could occur in the alternative, although the presence of the species is unlikely. Sightings of manatees in Louisiana riverine and estuarine habitats are rare and are more likely to occur in areas where submerged or emergent aquatic vegetation is available for forage (LDWF 2018). The West Indian manatee occurs in warm shallow estuarine waters adjacent to a freshwater source and with seagrass or other submerged or emergent vegetation for forage. No large beds of SAV occur within the alternative area (Love et al. 2013; NOAA

2018). In the unlikely event that a manatee moves into the Dugues Canal within the alternative, short-term, minor to moderate impacts may include disturbance via noise from in-water construction activities, including impact pile driving.

Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb fish and marine mammals resulting in short-term, minor to moderate impacts. Conservation measures to protect marine mammals from noise are discussed in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A). The timing of in-water noise-producing activities would be planned to minimize disturbances to marine life. BMPs, in addition to other avoidance and mitigation measures required by state and federal regulatory agencies, would minimize water quality impacts that could affect aquatic habitat.

Although protected species are not anticipated in the alternative, these measures would minimize any short-term, minor, adverse effects to aquatic habitats that may be used by protected aquatic species. Because protected aquatic species are not likely to occur in the alternative, and because conservation measures would be implemented, no adverse, long-term impacts to protected aquatic species are anticipated.

Protected Terrestrial Species

The following protected terrestrial species may occur in Jefferson Parish: piping plover and red knot. The alternative does not contain suitable habitat for either of these species, which require intertidal beaches/mud flats with no or very sparse vegetation for the piping plover, and barrier island systems for the red knot. Individuals may occur at the alternative during migration.

The proposed construction work in uplands would be located on an abandoned airport site with developed trees and wetland vegetation; therefore, shorebirds may be present in the area. During construction, shorebirds would likely move to undisturbed habitat located adjacent to the alternative. Once short-term impacts from construction are completed, these shorebirds would once again use suitable habitat in the alternative.

Critical Habitat

There is no designated critical habitat within or immediately adjacent to the alternative; therefore, there would be no impact to critical habitat.

4.6.7.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative features would be constructed within an aging abandoned airport site, with a high prevalence of wetlands; therefore, they may affect terrestrial wildlife. Parts of the site would be permanently converted from vegetated wetland areas to asphalt parking areas, recreation areas, recreational structures, and footpaths. Potential effects from construction of these features include removal of foraging, nesting, or other habitat; disturbance from noise during and after construction; and erosion and sedimentation of aquatic areas near construction that terrestrial species rely on for foraging or resting.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds resulting in short-term, minor to moderate impacts. These noises could be slightly more disturbing, compared to baseline conditions, to any resting or roosting birds that may use the site, although the site's proximity to motorized traffic from Lapalco Boulevard and residential areas may render these increases negligible. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6,

Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.6.7.2.4 Marine and Estuarine Fauna

Boardwalk and fishing pier construction would include placement of new piles using the least invasive techniques, given substrate and construction cost considerations (e.g., jetting, pushing, or driving the piles). In-water dredging or digging associated with installation of the pilings for the boardwalk is not anticipated, though minor, long-term substrate displacement and compaction from piling installation is expected. The number, size, and depth of pilings for each structure would be subject to final design.

The creation of the fishing piers and the boardwalk would permanently alter the shoreline area where the elements are placed and would likely increase impacts to nearby shoreline and open water areas because of increased human activities (e.g., boat traffic, litter). These long-term, minor impacts may affect aquatic fauna and local fisheries but would be limited to the small footprints and adjacent areas of the recreation enhancements. Temporarily disturbed aquatic fauna would experience short-term minor effects from construction but would likely find refuge in plentiful suitable habitats nearby. Therefore, the alternative would have short-term negligible to minor adverse effects on aquatic fauna or local fisheries. There is no designated EFH within or adjacent to the alternative.

The timing of in-water noise-producing activities would be planned to minimize disturbances to aquatic life. Potential impacts to estuarine and aquatic fauna would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna and managed species, as determined necessary by the Implementing Trustee. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.7.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.7.3 SOCIOECONOMIC ENVIRONMENT

4.6.7.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have to have a "disproportionately high and adverse" effect on a minority or low-income population. The alternative is located in Jefferson Parish, which has a per capita income level greater than the State of Louisiana and 46% minority population. The alternative would not have a disproportionately adverse effect on the community.

The alternative would provide a net benefit to the Westwego and greater New Orleans communities by providing improved and increased access to recreational activities, including fishing.

4.6.7.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by car, bus, boat, and foot to the recreational resources near the alternative. The proposed construction of the recreation enhancements would allow anglers, wildlife viewers, and others to better reach Bayou Segnette and other waterways connecting to the Gulf of Mexico. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.7.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve infrastructure associated with recreational use by providing a new recreational area with parking areas as well as a boardwalk, fishing piers, kayak and boat launches, activity and multi-purpose centers, restroom facilities, and light poles to support passive recreation and wildlife viewing. Although the alternative would provide a new recreational location in the parish, traffic on nearby roads would not be anticipated to increase substantially over existing conditions and would result in long-term, negligible to minor effects to local transportation infrastructure.

4.6.7.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the alternative. At least six cultural resources surveys have been conducted in the area (LDOA Report Nos. 22-3016, 22-3016-1, 22-3016-2, 22-0072, 22-2438, and 22-3560), but most considered the area to be of low probability for cultural resources and did not conduct intensive surveys near the alternative (e.g., Lee 2001; Wells et al. 2010). No previously identified cultural resources are recorded in the vicinity. According to USGS topographic maps, the Westwego Airport and the Bayou Segnette Oil Field were in operation prior to 1965, suggesting that the abandoned airport buildings and hangars and oil operations infrastructure may be of historic age and potentially significant in relation to the growth of the oil industry in Louisiana. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.7.3.5 Land Use and Agricultural Resources

The alternative was acquired for the purpose of installing water-based recreation enhancements. It is consistent with existing land use in the area and would not adversely affect current land use.

Agricultural lands are not present in the alternative; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.7.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve construction of recreational facilities such as a boardwalk, fishing piers, and restroom facilities. During construction, impacts to visual resources from the alternative would be adverse, minor, and short term primarily because of the presence of construction personnel, equipment (e.g., fences, stockpiles), vehicles, and unfinished structures visible to the public. Although the new recreational facilities would be seen from adjacent public roads and recreational navigators of Douglas Canal, they would improve accessibility to the Bayou Segnette water system, which would improve access to those visual resources. In addition, recreational use elements are expected to improve the long-term aesthetics of the old airport site, which until recently included abandoned buildings and overgrown vegetation.

Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. Impacts from construction may be adverse, but localized, minor, and short term. Long-term impacts would be beneficial because improvements would enhance accessibility to visual resources and improve aesthetics at the old airport site.

4.6.7.5 PUBLIC HEALTH AND SAFETY

4.6.7.5.1 Noise

Noise associated with equipment during construction of the boardwalk and fishing piers (including placement of new piles), kayak and boat launches, parking area, access road improvements, activity and multi-purpose centers, restroom facilities, and light pole installations would result in short-term, minor noise effects. Construction activities for the alternative would include mobilizing equipment, demolition of existing foundations, preparing the site, pile installation, placing new foundations, grading, and fill placement. Implementation of the alternative would include transportation of construction materials to the alternative, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

Residential communities near the alternative may be affected by noise during construction of the proposed facilities. These activities are expected to be short term. Construction noise can also be a nuisance to residents living or recreating on the shorelines adjacent to construction activities. Construction activities at the site would result in short-term, minor adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, visitors may cause some noise associated with parking and recreating, and some long-term minor, but negligible residual noise from personal vehicle use, boating, fishing, and other recreational activities would be anticipated.

4.6.7.5.2 Resiliency

The alternative includes construction of a boardwalk, fishing piers, kayak and boat launches, parking area, improved access road, activity and multi-purpose centers, restroom facilities, and light poles. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design. To minimize adverse, minor, long-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.

- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.8 Bayou Segnette State Park Improvements

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.8.1 PHYSICAL ENVIRONMENT

4.6.8.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates would be limited to re-paving of roads, parking, and the boating area. Operation and maintenance of these facilities may also affect soils and substrates. Soils at the alternative include Allemands muck, 0 to 0.2 percent slopes, very frequently flooded; Barbary muck, 0 to 1 percent slopes, frequently flooded; Cancienne silt loam, 0 to 1 percent slopes; Harahan clay; Kenner muck, 0 to 1 percent slopes, very frequently flooded; Larose muck; and Vacherie silt loam, gently undulating. None of these soils are highly erodible.

In-water work may occur in areas of the existing boat ramps and docks during re-paving. The in-water work would be limited to areas with existing pavement and would not extend the existing footprint of the boating areas in or out of the water. In addition, all other areas of re-paving would be limited to the existing footprints of the park roads and parking areas resulting in short-term, minor effects. Substrate displacement or compaction would be unlikely to occur as a result of the alternative activities and would not likely alter current geological, soil, or substrate conditions in the terrestrial environment. Repaving of roads and parking areas would include repairs to the road base, as needed, and an asphalt overlay creating a 2- or 6-inch lift, as well as extra asphalt wedges and steel hinged plates at bridge transitions. No piling work is expected at the docks associated with the boat launches. If piling work is later determined to be necessary, it would be limited to replacing existing pilings with longer pilings installed in the same location as the existing pilings.

Construction equipment for staging would likely include bulldozers, graders, a bobcat, and dump trucks. Staging is anticipated to occur within the Bayou Segnette State Park on existing parking areas. Repairs to the roads, parking, and boating areas would not be expected to impact soils and substrates. Existing roadways and footpaths would be used to direct foot and vehicle traffic into designated areas, minimizing minor adverse impacts to the overall site during and after construction.

Long-term disturbances to terrestrial soils and substrates would not likely occur on the site from the alternative activities because they would be conducted entirely on existing infrastructure footprints. Some terrestrial piling work may be conducted at the playground area associated with these improvements, but it would be limited to the existing developed playground area. Stockpiling of soils would not be needed for these alternative elements. Excavated soils would be stockpiled on-site in order to reclaim and revegetate areas disturbed but not needed for alternative features.

4.6.8.1.2 Hydrology and Water Quality

The alternative includes some minor in-water work for re-paving of the boating area. The alternative would implement the hydrology and water quality BMPs described in Section 4.3.1 to avoid and minimize potential effects to receiving water bodies. However, these effects would be minor, short term, and localized, and would conclude once construction is completed. The area taken up by impervious surfaces within the Bayou Segnette State Park would not change as a result of the road and parking. However, design changes such as the installation of pervious pavement and other low-impact design tools could improve water quality by reducing polluted stormwater runoff. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.8.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, small excavators, fork lifts, rollers, generators, small trucks, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use that may result, the potential increase in emissions would be nominal.

4.6.8.2 BIOLOGICAL ENVIRONMENT

4.6.8.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative features under consideration include minor in-water work associated with the re-paving of boating areas. Upland-based work is also proposed for re-paving of roads and parking areas and construction of new fall surfacing and playground equipment within the existing playground area. The 676-acre site is currently managed as a state park that includes numerous recreational structures and associated infrastructure, as well as natural areas, and includes natural areas of upland, wetland, and aquatic habitats. The primary impacts to the environment would be through the short-term effects of construction, including potential erosion and sedimentation.

In-water work associated with re-paving of the boating areas would taper the proposed 6-inch lift in the boating area to the existing boat launch elevation and would be limited to approximately 2,500 square feet of pavement below high tide within the existing footprint of paved areas and would result in minor, short-term effects. The alternative elements would be limited to areas of existing infrastructure and would be unlikely to cause disturbances to surrounding natural areas. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby

during construction activities. Therefore, the re-paving of the roads, parking areas, and boating area and replacement of the playground structures would not be anticipated to have any adverse, long-term effects on terrestrial, coastal nearshore, or marine habitats.

One of the primary goals of the alternative is to promote recreational fishing; therefore, an increase in fishing pressure could result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Parking capacity would limit the total number of visitors, thereby putting an upper limit on the magnitude of fishing pressure resulting from the alternative. The use of trawl gear or gillnets within the alternative is not expected. Although recreational fishing would increase from current levels, it is not expected to have long-term, substantive, adverse effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. The state park currently implements trash management that includes a centralized dumpster repository as well as routine trash collection efforts. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.8.2.2 Protected Species

Protected Aquatic Species

The alternative features would be limited to the existing infrastructure footprint and include some minor in-water work in freshwater riverine habitat. This in-water work would not occur in habitat that has the potential for protected species that may occur in Jefferson Parish. Protected aquatic species are unlikely to be present near the alternative, therefore effects to protected aquatic species would not be anticipated.

Protected Terrestrial Species

All construction associated with the alternative would occur in uplands within the existing 676-acre Bayou Segnette State Park and within the existing park footprint. The proposed work does not occur in habitat that is optimal for the protected species that may occur in St. Bernard Parish, which include piping plover and red knot. Due to lack of suitable habitats near the alternative these protected species are unlikely to be present, therefore effects to these species would not be anticipated.

Critical Habitat

Critical habitat is designated in Jefferson Parish for piping plover and Gulf sturgeon. However, these areas are not located near the alternative. Therefore, no effect to critical habitats would result from implementation of the alternative.

4.6.8.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative features would occur within an existing state park that has been previously developed and managed for human and natural environment land uses. Several migratory bird species have the potential to occur within the alternative. However, the alternative terrestrial elements would only occur on previously constructed roads, parking areas, and playgrounds and would not involve any vegetation clearing. Best practices as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts to terrestrial wildlife and migratory birds. Therefore, adverse effects on these species would not be anticipated.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pavers) is known to disturb migratory and shorebirds resulting in short-term, minor to moderate effects. These noises could be slightly more disturbing, compared to baseline conditions, to any resting or roosting birds that may use the site. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential short-term, minor to moderate adverse impacts to wildlife would be minimal.

4.6.8.2.4 Marine and Estuarine Fauna

The minor in-water work associated with re-paving the boating areas would consist of laying asphalt up to a 6-inch lift. However, this work would be conducted entirely within the existing footprint of the boat area infrastructure and would not affect surrounding marine and estuarine fauna. The alternative is located within EFH. Potential impacts to estuarine and aquatic fauna would be considered and avoided or minimized to the extent practicable during design and construction. Adverse effects to EFH would not be anticipated.

The timing of in-water noise-producing activities would be planned to minimize disturbances to marine life. When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna, EFH, and managed species, as determined necessary by the Implementing Trustee. Trash is actively managed at the Bayou Segnette State Park, and littering would be minimized. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.8.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.8.3 SOCIOECONOMIC ENVIRONMENT

4.6.8.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have to have a "disproportionately high and adverse" effect on a minority or low-income population. Although the Jefferson Parish is a minority population that is disproportionately more low-income than elsewhere in the state, the alternative would not have a disproportionately adverse effect on these communities and in fact would provide a net benefit to nearby communities by providing improved and increased access to recreational activities, including fishing.

4.6.8.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by car, boat, foot, and public transportation to the recreational resources near the alternative. The proposed re-paving of the roads, parking areas, and boating areas, as well as the improvements to the playground, would allow anglers, wildlife viewers, and

others to better reach recreational waterways and the Gulf of Mexico. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.8.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve existing infrastructure associated with recreational use by repairing existing roads, parking areas, and boating areas within the Bayou Segnette State Park. Although the alternative would likely increase recreational use of the park, traffic on nearby roads would not be anticipated to increase substantially over existing conditions and would result in long-term, but negligible effects.

4.6.8.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the improvements and of Bayou Segnette State Park. Cultural resources surveys have been conducted in portions of the park, including intensive investigations along either side of hurricane protection levee that fronts Bayou Segnette (LDOA Report Nos. 22-3069 and 22-3560) and assessments of resources along the bank (LDOA Report No. 22-0732). No cultural resources have been identified within the park; however, one site (16JE26) lies immediately adjacent to the park. The site, which represents the remains of a steam dredge from the early twentieth century, was initially recommended as potentially eligible, but further investigation in 2016 recommended it as not eligible for the NRHP (Heller et al. 2016). Most of the alternative within Bayou Segnette State Park involves re-paving existing roadways to provide additional elevation, and this would likely entail little to no additional ground disturbance outside the area already disturbed. Consultation with the Louisiana SHPO and tribes to determine any additional requirements may be necessary prior to any ground-disturbing activities under the alternative.

4.6.8.3.5 Land Use and Agricultural Resources

The alternative was acquired in 1987 by the State of Louisiana for the purpose of establishing the Bayou Segnette State Park. The alternative is consistent with existing land use in the area, is designated as a state park, and would not adversely affect current land use.

Agricultural lands are not present on the alternative; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.8.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve improvements to the existing boating area, playground, roads, and parking areas, which would have minor, long-term benefits to aesthetics of the park. During construction, impacts on visual resources from the alternative would be minor, short term, and adverse, primarily because of the

presence of construction personnel, equipment (e.g., fences, stockpiles), vehicles, and unfinished structures visible to the public. Even though existing viewsheds would be temporarily affected, these impacts would not dominate the view or detract from current user activities or experiences.

Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. Overall, impacts from construction may be adverse, but localized, minor, and short term. Overall, long-term impacts would be beneficial because as improvements would enhance the park's aesthetics.

4.6.8.5 PUBLIC HEALTH AND SAFETY

4.6.8.5.1 Noise

Noise associated with equipment during the re-paving of roads, parking areas, and boating areas and construction associated with the proposed playground improvements would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, asphalt laying, grading, and minor foundation work. Implementation of the alternative would include transportation of construction materials to the alternative, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

Human communities near the alternative may be affected by noise during construction of the proposed facilities. These activities are expected to be short term. Construction noise can also be a nuisance to residents living or recreating on the shorelines adjacent to construction activities. Construction activities at the site would result in short-term, minor adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, increased recreational use by visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts at the alternative from personal vehicle use, fishing, and other recreational activities would likely be adverse, but minor.

4.6.8.5.2 Resiliency

The alternative includes re-paving roads, parking areas, and boating areas and construction associated with the proposed playground improvements. The existing roads, parking areas, and boating areas would be lifted by 2 inches across the whole park and by 6 inches in the boating areas to address current flooding issues and damages from previous floods, and improve resiliency. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be further determined during final design. To minimize adverse, minor, long-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.9 Atchafalaya Delta Wildlife Management Area Access

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.9.1 PHYSICAL ENVIRONMENT

4.6.9.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include dredging the passes and the placement of dredge spoils. Soils at the alternative include Aquents, dredged, 0 to 1 percent slopes; Balize and Larose; and Bancker muck, tidal. Each of these soils are frequently flooded.

Only in-water work is proposed because construction for access improvements would take place within the active channels of Breaux and Cul-de-sac Passes. The dredging and dredge spoil footprints would not exceed approximately 8 acres for Breaux Pass and approximately 16 acres for Cul-de-sac Pass. Dredging would result in substrate displacement and compaction from dredge spoils would result. Operation and maintenance of Breaux and Cul-de-sac Passes would not affect soils and substrates.

Construction equipment for the access improvements would include a floating bucket dredge and hand-crews. Staging would take place on a floating barge, resulting in surface disturbance that is limited to site-specific compaction, minimizing short-term, minor adverse impacts to the overall site.

Minor, short-term disturbances to substrates would occur on-site from construction and some wetland soils may be disturbed during site preparation activities. Long-term effects to soils would occur from placement of dredged materials. However, the impacts would be localized to the site-specific dredged and dredge spoils areas across the alternative. Areas not necessary for completing the improvements of Breaux and Cul-de-sac Passes would not be disturbed during construction.

4.6.9.1.2 Hydrology and Water Quality

The alternative includes in-water work for the dredging and dredge placement activities. The alternative would implement hydrology and water quality BMPs described in Section 4.3.1 to avoid and minimize potential effects on receiving water bodies. However, these effects would be minor, short term, and localized, and would conclude once construction is completed.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of sedimentation from construction-related activities.

4.6.9.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as trucks (equipment delivery to WMA), and small barges with a dredger, a crane, pile drivers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a continuation of emissions from the recreational use of the site; however, even with the potential increase in use that may result from improved recreational boating access, the potential increase in emissions would be nominal, and would not be expected to cause an exceedance of the NAAQS.

4.6.9.2 BIOLOGICAL ENVIRONMENT

4.6.9.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative features under consideration include improvements to Breaux and Cul-de-sac Passes, and would be exclusively in-water work. The alternative is located within the Main Delta of the Atchafalaya River. According to the NWI, the alternative is located within a freshwater riverine system, with associated freshwater emergent wetland and freshwater forested/shrub wetland (USFWS 2017b). All of these listed species can tolerate freshwater habitats and are known to migrate from estuarine environments into freshwater riverine systems at various times of the year (NatureServe 2016).

The alternative access improvement locations are developed, existing passes; all activities would take place in disturbed wetland or aquatic habitats. The primary impacts to the environment would be through the short-term, minor effects of construction, including sedimentation. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities.

The sediment from Breaux's Pass and Cul-de-Sac Pass would be used to enhance and nourish wetlands. The sediment removal from Breaux's Pass would also act as sediment diversion, allowing sediment-laden water from the Atchafalaya River to flow west and enhance wetlands on the western side over the next 10 years, resulting in a long-term beneficial impact to habitats.

The access improvements to the passes would permanently alter the shorelines of the passes and potentially increase human activities (e.g., boat traffic, litter), resulting in long-term minor adverse effects to habitats in localized areas. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure adverse impacts are minimized. Therefore, the access improvements would not be anticipated to have adverse, long-term effects on terrestrial, coastal nearshore, or marine habitats.

One of the primary alternative goals is to improve access for recreational fishing; therefore, an increase in fishing pressure would result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Pass capacity would limit the total number of visitors to the interior marsh, thereby putting an upper limit on the magnitude of fishing pressure resulting from the alternative. The use of trawl gear or gillnets within the alternative is not expected. Although recreational fishing would increase from current levels, it is not expected to have long-term, substantive, adverse effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.9.2.2 Protected Species

Protected Aquatic Species

The alternative features would have a small footprint of in-water work, all in the river. The alternative could have potential short-term impacts to marine life stages of green, Kemp's Ridley, and loggerhead sea turtles; West Indian manatee; and pallid sturgeon during construction activities, if individuals are present. The sea turtle species may occur in nearshore or inshore estuarine waters that contain seagrass or other submerged or emergent vegetation used as forage or may harbor prey species (NOAA Fisheries 2017). No large beds of SAV have been mapped within the area (Love et al. 2013; NOAA 2018); however, small patches of sea grass may be present. In the unlikely event that a sea turtle moves into the alternative area, direct impacts may include disturbance via noise, disorientation, or reduced visibility due to turbidity from dredging.

The West Indian manatee occurs in warm, shallow estuarine waters adjacent to a freshwater source and with seagrass or other submerged or emergent vegetation for forage. Sightings of manatees in Louisiana riverine habitats are rare and would likely occur in areas where submerged or emergent aquatic vegetation is available for forage (LDWF 2018). If a manatee is present during construction of the alternative, impacts may include short-term disturbance via human activities and noise from dredging activities and avoidance due to short-term, increased turbidity.

The pallid sturgeon is found in large, turbid, free-flowing riverine habitats including the Atchafalaya River. Additionally, distribution of the species includes the Atchafalaya watershed (NatureServe 2016). Short-term, adverse, minor impacts to the pallid sturgeon could occur from dredging activities resulting in habitat loss and degradation of water quality within the localized area.

Noise from construction equipment (e.g., dredging equipment) is known to disturb fish and marine mammals and would result in short-term, minor to moderate impacts. Conservation measures to protect protected aquatic species from noise are discussed in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A). The timing of in-water noise-producing activities would be planned to minimize disturbances to protected aquatic species. BMPs, in addition to other avoidance and mitigation measures as required by state and federal regulatory agencies, would minimize water quality impacts that could affect aquatic species and their habitats.

Protected Terrestrial Species

Although piping plover and red knot are found in St. Mary Parish, suitable habitat for these species is not present in the alternative. Adverse impacts to protected terrestrial species are not anticipated from the alternative.

Critical Habitat

No critical habitat has been identified in the alternative vicinity; therefore, the alternative would not be expected to have adverse effects on designated critical habitat.

4.6.9.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative would occur within Breaux and Cul-de-sac Passes, which have adjacent shorelines and uplands, and therefore may result in minor effects to terrestrial wildlife during construction. Terrestrial wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., dredging equipment) is known to disturb shorebirds and result in short-term, minor impacts. Terrestrial wildlife would benefit over the long term from enhanced wetlands within the WMA.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., dredging equipment) is known to disturb migratory and shorebirds. These noises could be slightly more disturbing, compared to baseline conditions, to any resting or roosting birds that may use the site, although the site's proximity to waterway traffic may render these increases negligible. As previously discussed, the alternative would include the BMPs described in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.6.9.2.4 Marine and Estuarine Fauna

In-water work proposed for construction of access improvements would include dredging and dredge spoil activities. In-water work would occur in relatively shallow estuarine and wetland habitats. The dredging and dredge spoil footprints for the alternative would not exceed approximately 23 acres of substrate displacement in open/in-water areas.

Designated EFH is present within the alternative. The alternative would have minor, long-term effects to open water areas because of increased human activities (e.g., boat traffic, litter) and could disturb aquatic fauna, fisheries, and EFH in localized areas. The footprints of the dredged areas are small, 8 and 15 acres, and disturbances are expected to be minor and short term. Temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby and effects to aquatic fauna, local fisheries, and designated EFH would be short term.

The timing of in-water noise-producing activities would be planned to minimize disturbances to marine life. Potential impacts to estuarine and aquatic fauna, managed fisheries, and EFH would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna, EFH, and managed species, as determined necessary by the Implementing Trustee. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit. The alternative should be self-mitigating because of the sediment-carrying capacity of Breaux's Pass, which would be conducive to building wetlands over 10 to 20 years.

4.6.9.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.9.3 SOCIOECONOMIC ENVIRONMENT

4.6.9.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have to have a "disproportionately high and adverse" effect on a minority or low-income population. St. Mary Parish currently has 22% of its population below the poverty level. However, alternative activities are not

anticipated to impact minority or low-income populations. Thus, the alternative would not have a disproportionately adverse effect on environmental justice communities. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users.

4.6.9.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The Atchafalaya Delta WMA receives 25,000 visitors annually (LDWF 2016). The alternative would serve to improve public recreational boating (for fishing and hunting) access to the interior marsh of WMA's Main Delta. The proposed access improvements to Breaux and Cul-de-sac Passes would allow anglers, hunters, wildlife viewers, and others to better reach the interior marsh. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.9.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure since it is wholly located within the WMA in an extremely remote setting. The alternative would improve access within the WMA.

4.6.9.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of each proposed channel dredging location and of the Atchafalaya Delta WMA. At least one cultural resources survey area intersects portions of the alternative. This survey, a three-dimensional seismic survey of Bayou Sale Swamp (LDOA Report No. 22-2664), surveyed the banks of water bodies in the vicinity and did not include subsurface investigations (Smith et al. 2006). No previously recorded cultural resources have been identified in the immediate area.

According to USGS topographic maps, the deltaic marsh at the mouth of the Atchafalaya River was not formed until between 1970 and 1981, meaning that no historic properties could be present on the surface. Furthermore, a 1957 USGS topographic map depicts the water depths near the alternative, prior to the accretion of dry land, as between 7 and 11 feet deep. This would suggest that the 10 feet of proposed excavation for the alternative would be mostly within sediments that are less than 60 years old, limiting the potential for intact cultural resources. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.9.3.5 Land Use and Agricultural Resources

The alternative has been owned and managed by LDWF since 1978. It is consistent with existing land use in the area, and has no zoning designations. Given this, the access improvements would not adversely affect current land use.

Agricultural lands are not present on the alternative; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.9.4 AESTHETICS AND VISUAL RESOURCES

Construction activities associated with the alternative would be limited to dredging two shoaled passes to enhance recreational access, which may impede the natural aesthetics and visual resources of the area during construction; however, such impacts would be short term. Impacts from construction may be adverse, but localized, minor, and short term.

4.6.9.5 PUBLIC HEALTH AND SAFETY

4.6.9.5.1 Noise

Noise associated with equipment during construction of the access improvements would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment on floating barges, and dredging Breaux and Cul-de-sac Passes to depths of 10 feet each. Implementation of the alternative would include transportation of construction materials to the alternative, which would initially include trucks to reach the edge of the WMA and then a transition to in-water, floating types of transportation (i.e., boats and barges) that would contribute to short-term noise disturbances.

No communities or permanent residents are near the alternative. Construction noise can be a nuisance to boaters and anglers living or recreating on the shorelines near construction activities, but these impacts are expected to be negligible and short term. Standard practices, such as muffle units for equipment, could be implemented during construction to mitigate noise impacts.

Once the improvements are constructed, visitors may cause some noise associated with boating and recreating.

4.6.9.5.2 Resiliency

The alternative includes access improvements to Breaux and Cul-de-sac Passes. The resiliency of the proposed access improvements to sustain sea-level rise, hurricanes, and storm surges would be determined during final design.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.10 Atchafalaya Delta Wildlife Management Area Campgrounds

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.10.1 PHYSICAL ENVIRONMENT

4.6.10.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include the installation of the 1,200-foot-long bulkhead and the installation of two jetties, one 85 feet long (west) and one 120 feet long (east). Operation and maintenance of the campground improvements would not affect soils and substrates. Soils at the alternative include Aquents, dredged, 0 to 1 percent slopes; Balize and Larose; and Bancker muck, tidal. All of these soils are frequently flooded.

In-water work and upland work are expected because the construction for the jetties and bulkhead would take place both within the water and along the immediate shoreline.

Staging would take place on the floating barge; some equipment and personnel may be placed on the uplands of the campground but would be minimized to the extent practicable, resulting in surface disturbance that is limited to site-specific compaction, minimizing adverse impacts to the overall site.

Short-term, minor disturbances soils and substrates would occur on-site from construction and site preparation activities. Areas where alternative features would be placed would permanently convert soils and substrates at that location. However, the impacts would be localized to the site-specific bulkhead and jetty areas within the alternative and minor. Because the site is currently developed (i.e., the pit restroom, wooden docks, and campground), it is anticipated that areas not necessary for improvements would not be disturbed during construction.

4.6.10.1.2 Hydrology and Water Quality

The alternative includes in-water and upland work for the campground improvement activities which could affect water quality. However, these effects would be minor, short term, and localized, and would conclude once construction is completed. Users of the campground have potential to increase the release of pollutants into the receiving water body; however, this represents no change from the existing conditions. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of sedimentation from construction-related activities.

4.6.10.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as trucks (equipment delivery to WMA), and small barges with dredgers, cranes, pile hammers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not

require a detailed assessment. Long-term, ongoing impacts include a continuation of emissions from the recreational use of the site; however, even with the potential increase in use that may result from improved recreational boating access, the potential increase in emissions would be nominal, and is not expected to cause an exceedance of the NAAQS.

4.6.10.2 BIOLOGICAL ENVIRONMENT

4.6.10.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative features under consideration include construction of the bulkhead and jetties for the Wax Lake Outlet Campground. The alternative is located within the Wax Lake Delta of the Atchafalaya River, approximately 4.6 miles from estuarine or marine environments. According to the NWI, the alternative is located predominately within freshwater emergent wetland, associated with a freshwater riverine system (USFWS 2017b).

The alternative is an existing, developed, campground; all activities would take place in disturbed wetland, upland, or aquatic habitats. The primary impacts to the environment would be the result of construction activities that may produce sedimentation in aquatic habitats.

In-water work associated with the access improvements would consist of installing and backfilling the jetties and bulkhead, resulting in substrate displacement and compaction from material excavation and placement. Installing the bulkhead would include preparation of approximately 1,200 feet of shoreline: staging bulkhead material, and mobilizing the equipment on the floating barge.

Installing the jetties would require the staging of on-water equipment, driving wood or vinyl piles into the substrate, and backfilling of substrate. Once installed the jetties would be about 50 feet apart.

The campground improvements would permanently alter the shorelines within the footprint of proposed jetties and the steel bulkhead where natural shoreline would be converted to an armored shoreline, and would increase human activities (e.g., boat traffic, litter). These impacts would affect habitats in localized areas and would be long term but minor. The footprint of the campground and the frequency of use by recreationists are preexisting, and temporary disturbances are expected to be limited in scope and duration. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities. Therefore, the campground improvements would not be anticipated to have adverse, long-term effects on terrestrial, coastal nearshore, or marine habitats.

One of the primary alternative goals is to enhance recreational fishing and hunting opportunities; therefore, an increase in fishing and hunting pressure may result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Campground capacity and LDWF visitation duration regulations would limit the total number of visitors to the campground, thereby putting an upper limit on the magnitude of fishing and hunting pressure resulting from the alternative. The use of trawl gear or gillnets within the alternative is not expected. Although recreational fishing may increase from current levels, it is not expected to have substantive adverse effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.10.2.2 Protected Species

Protected Aquatic Species

The alternative features would have a small footprint of in-water and upland work. The alternative could have short-term, minor adverse impacts to pallid sturgeon and West Indian manatee if individuals are present during construction. The pallid sturgeon is found in large, turbid, free-flowing riverine habitats including the Mississippi River and the distribution of the species includes the Atchafalaya watershed (NatureServe 2016). Short-term impacts to the pallid sturgeon could occur from dredging activities resulting in potential minimal levels of habitat loss due to changes in channel depths and substrate composition and increased turbidity during construction. These effects would be short-term and limited to the localized area.

The West Indian manatee occurs in warm, shallow estuarine waters adjacent to a freshwater source and with seagrass or other submerged or emergent vegetation for forage. Sightings of manatees in Louisiana riverine habitats are rare and would likely occur in areas where submerged or emergent aquatic vegetation is available for forage (LDWF 2018). Because of the alternative's proximity to marine habitats, the common bottlenose dolphin may also occur in the area. If a manatee or common bottlenose dolphin is present during construction of the alternative, impacts may include short-term disturbance via human activities, noise from dredging activities, avoidance due to short-term increased turbidity, and potential strikes from construction equipment.

Noise from construction equipment (e.g., scoops, buckets, or barges) is known to disturb fish and marine mammals. Conservation measures to protect protected aquatic species from noise are discussed in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A). The timing of in-water noise-producing activities would be planned to minimize disturbances to protected aquatic species. BMPs, in addition to other avoidance and mitigation measures as required by state and federal regulatory agencies, would minimize water quality impacts that could affect aquatic species and their habitats.

Protected Terrestrial Species

Although piping plover and red knot are found in St. Mary Parish, suitable habitat for these species is not present in the alternative. Adverse impacts to protected terrestrial species are not anticipated from the alternative.

Critical Habitat

The nearest mapped critical habitat, for the piping plover, is approximately 9.4 miles southeast of the alternative. Since no critical habitat is present within the alternative, the alternative would not be expected to have adverse effects on designated critical habitat.

4.6.10.2.3 Terrestrial Wildlife, including Migratory Birds

Terrestrial wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., scoops, buckets, and pile installation equipment) is known to disturb fish, marine mammals, and shorebirds resulting in short-term, minor to moderate impacts.

The alternative features would occur at the Wax Lake Outlet Campground, which has both shorelines and uplands, and therefore may affect terrestrial wildlife. Minimal uplands adjacent to the alternative would be disturbed; the disturbance would be limited to compaction of backfilling soils on the 1,200-foot

bulkhead. Potential effects from construction of campground improvements features include disturbance from noise and erosion and sedimentation of aquatic areas near construction that terrestrial species rely on for foraging or resting.

During the alternative design phase, coordination with USFWS and LDWF would occur to locate and design alternative features to avoid or minimize impacts to migratory bird nesting habitats or important feeding and loafing areas.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., scoops or buckets and pile hammer) is known to disturb migratory and shorebirds resulting in short-term, minor to moderate impacts. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions, although the site's proximity to Wax Lake Outlet channel traffic may render these increases negligible. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.6.10.2.4 Marine and Estuarine Fauna

Shoreline work proposed for construction of access improvements would include the installation of jetties, bulkheads, and docks. In-water work would occur in relatively shallow estuarine and wetland habitats. The alternative would permanently alter the shoreline area where these facilities are placed and could increase impacts to nearby shoreline and open water areas because of increased human activities (e.g., boat traffic, litter) in the relatively small footprint resulting in long-term but minor impacts.

Designated EFH is present within the alternative. Construction activities may adversely affect aquatic fauna, fisheries, and EFH in localized areas but these disturbances would result in short-term, minor effects because of the limited in scope. Temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby.

The timing of in-water noise-producing activities would be planned to minimize disturbances to marine life. Potential impacts to estuarine and aquatic fauna, managed fisheries, and EFH would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna, EFH, and managed species, as determined necessary by the Implementing Trustee. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.10.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.10.3 SOCIOECONOMIC ENVIRONMENT

4.6.10.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have to have a “disproportionately high and adverse” effect on a minority or low-income population. St. Mary Parish currently has 22% of its population below the poverty level. However, alternative activities are not anticipated to impact minority populations or low-income populations. Thus, the alternative would not have a disproportionately adverse effect on environmental justice communities. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users.

4.6.10.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The Atchafalaya Delta WMA receives 25,000 visitors annually (LDWF 2016). The alternative would serve to improve public recreational opportunity (for camping, fishing and hunting) at the Wax Lake Outlet Campground of the WMA’s Wax Delta. The proposed campground improvements would provide anglers, hunters, wildlife viewers, and others enhanced recreation opportunities. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.10.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure since it is wholly located within the WMA in an extremely remote setting. The alternative would improve campground infrastructure within the WMA over the long term.

4.6.10.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resources managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior’s Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of campground improvements and of the Atchafalaya Delta WMA. One cultural resources survey area intersects portions of the alternative. This survey, a three-dimensional seismic survey of Bayou Sale Swamp (LDOA Report No. 22-2664), surveyed the banks of water bodies in the vicinity and did not include subsurface investigations (Smith et al. 2006). No previously recorded cultural resources have been identified in the immediate area. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.10.3.5 Land Use and Agricultural Resources

The alternative has been owned and managed by LDWF since 1978. It is consistent with existing land use in the area, and has no zoning designations. Given this, the access improvements would not adversely affect current land use.

Agricultural lands are not present on the alternative; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.10.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve improvements to the existing campgrounds, which would have a minor benefit to aesthetics of the site. The construction of new bulkheads and jetties near the campground could be considered unappealing to some recreational users, which would result in minor, negative effects to aesthetics. Conversely, installing the bulkheads would reduce shoreline erosion, which could improve the aesthetics of the area for other recreational users.

Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. Overall, long-term impacts from construction may be considered adverse or beneficial, depending on the user's perspective. These impacts would be localized, minor, and short term. No effects to the surrounding visual resources would be anticipated from the alternative.

4.6.10.5 PUBLIC HEALTH AND SAFETY

4.6.10.5.1 Noise

Noise associated with equipment during construction of the campground improvements would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment on floating barges, scoop and bucket activities, pile driving for the jetties, and backfilling of the bulkhead. Implementation of the alternative would include transportation of construction materials to the alternative, which would initially include trucks to Berwick, Louisiana, and then a transition to in-water, floating types of transportation (i.e., boats and barges) that would contribute to minor, short-term noise disturbances.

No communities or permanent residents are near the alternative. However, there are boathouses moored to the shoreline and an island adjacent to the western end of the campground. Construction noise would likely be a nuisance to boaters and anglers living in boathouses or recreating on the shorelines near construction activities, but these impacts would be minor and short term. Standard practices, such as muffle units for equipment, could be implemented during construction to mitigate noise impacts.

Once the improvements are constructed, visitors may cause some noise associated with boating and recreating, but these would not be anticipated be higher than the current levels. Overall, long-term noise impacts at the alternative from boating, fishing, and other recreational activities would likely be minor.

4.6.10.5.2 Resiliency

The alternative includes improvements to the existing Wax Lake Outlet Campground. The resiliency of the proposed improvements to sustain sea-level rise, hurricanes, and storm surges would be determined during final design.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.11 Rockefeller Piers and Rockefeller Signage

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.11.1 PHYSICAL ENVIRONMENT

4.6.11.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include development of the four piers and installing signage. Operation and maintenance of these facilities may also affect soils and substrates. Marsh soil throughout the RWR is Scatlake mucky clay. This soil is frequently flooded, very poorly drained and slightly erodible.

In-water work is expected for the construction of the four piers. Wooden pier construction would include placement of new treated wooden piles using a pile driver. Substrate displacement and compaction from piling installation would result in minor, long-term impacts. The number, size, and depth of piles for the piers would be subject to final design, although it is expected that minimal substrate would be displaced in the marine environment. Upland and in-water work associated with the sign installation would be negligible and primarily consist of installation of signs on existing sign frames in public facilities in upland areas, or placement of wooden or metal posts into above water sites for directional signage throughout the Refuge. Construction equipment for staging would likely include bulldozers and graders, pile driving machinery, barge(s), a bobcat, and dump trucks. Staging is anticipated to occur in areas proposed for pier development. Existing roadways and footpaths would be used to direct foot and vehicle traffic into designated areas, minimizing short-term, minor adverse impacts to the overall site during and after construction.

Minor, short-term disturbances to terrestrial soils and substrates may occur on-site from construction and site preparation activities. However, the impacts would be localized to several small areas across the Refuge. Any excavated soils would be minimal and would be stockpiled on-site in order to reclaim and revegetate disturbed areas that are not needed for development of the proposed improvements.

4.6.11.1.2 Hydrology and Water Quality

The alternative includes in-water work for construction of the piers. Additionally, ground disturbance as a result of excavation and grading during construction could result in sedimentation entering the surrounding waterway. No impact to hydrology and water quality is anticipated from installation of proposed signage. The adverse effects from in-water work would be localized and minor, concluding once construction is completed. The area taken up by impervious surfaces within the RWR would not change hydrology as a result of the proposed improvements. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D

Prior to construction, federal and state permits for any in-water work and construction would be obtained, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.11.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as trucks, backhoes, tractor trailers, cranes, small excavators, fork lifts, roller, generators, small trucks, pile drivers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of construction, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use from vehicles, the potential increase in emissions would be nominal.

4.6.11.2 BIOLOGICAL ENVIRONMENT

4.6.11.2.1 Terrestrial, Coastal-Nearshore, and Marine Habitats

The alternative features under consideration include the upland-based signage and in-water work proposed for construction of the piers. Proposed improvement areas within the 71,000-acre Refuge are within a mix of existing facility areas operated by the RWR and undeveloped areas proposed for enhancement. Proposed signage improvements would take place in disturbed and undisturbed upland areas throughout the Refuge. Pier developments would take place in and adjacent to aquatic habitats within the Refuge. The primary impacts to the environment would be through the short-term effects of construction, including potential erosion and permanent effects from placement of wooden piles.

In-water work associated with the piers would require the driving of wooden piles into the substrate, which would result in short-term, minor effects to marine habitats. Long-term impacts from placement of piles would permanently convert substrate, resulting in minor, long-term impacts that are not anticipated to disturb to surrounding natural areas. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities.

One of the primary goals of the alternative is to promote recreational fishing; therefore, an increase in fishing pressure would result. The use of trawl gear or gillnets within the alternative is not expected. Although recreational fishing would increase from current levels, it is not expected to have long-term, substantive, adverse effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. The RWR currently implements trash management that includes a centralized dumpster repository as well as routine trash collection efforts. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.11.2.2 Protected Species

Protected Aquatic Species

The alternative would not impact protected aquatic species. This is because of 1) the lack of suitable deep-water marine habitat, 2) no mapped extensive areas of seagrass or marine vegetation, and 3) the absence of riverine or beach habitats. In addition, the alternative is outside the current known range of protected aquatic species, and no known occurrences have been documented within the general vicinity (LDWF 2014; Love et al. 2013; NOAA 2017; NatureServe 2016).

Protected Terrestrial Species

Piping plover and red knot both require estuarine and marine shoreline habitat, which are found throughout the RWR. These species have been documented in the Refuge and the alternative is in suitable habitat for these species. All of the proposed signage would be installed in wetlands, whereas proposed in-water piers would be constructed adjacent to salt marsh uplands. During construction, noise and human presence would disturb piping plover and red knot, and these impacts would be minor and short term to moderate. These species would likely move to undisturbed habitat located adjacent to these areas to avoid disturbance. Once short-term impacts from construction are completed, these shorebirds would once again use suitable habitat surrounding the proposed improvements.

Best practices and conservation measures as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A), would be followed during construction to avoid impacts to protected species such as the red knot and piping plover. Additionally, all individuals working on the alternative construction would be provided with information in support of general awareness of piping plover and red knot presence and the means to avoid birds and their critical or otherwise important habitats. The proposed construction work would avoid working in designated critical habitat when piping plovers are present or important wintering sites for red knots when they are present to the maximum extent practicable. If work must be conducted when these species are present, construction workers would avoid working near concentrations of individuals or post avoidance areas to minimize disturbance. Consultation with USFWS would continue pending the final design of the piers. With the implementation of the best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A), no adverse, long-term effects to the piping plover and red knot are anticipated.

Critical Habitat

No critical habitat for any protected species is located within the alternative; therefore, the alternative would not be expected to have adverse effects to designated critical habitat. The alternative is located approximately 3 miles from critical habitat designated for the piping plover (Unit LA-1). Piping plover–designated critical habitat is located all along the shoreline of RWR where PCEs for overwintering piping plovers may occur. PCEs include intertidal flats, including sand and/or mud flats with no or very sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting plovers. The alternative would not occur in PCEs and loss of habitat, is not anticipated.

4.6.11.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative would predominantly occur within an existing state wildlife refuge that has been previously developed and managed for human and natural environment land uses. Several migratory bird species have the potential to occur within the area, and construction noise could result in short-term impacts to shorebirds. Best practices as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts to terrestrial wildlife and migratory birds. Therefore, adverse effects to these species would not be anticipated.

Terrestrial wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds resulting in short-term, minor to moderate impacts. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.6.11.2.4 Marine and Estuarine Fauna

In-water work associated with pier development would consist of placing pilings and would require minimal removal of vegetation along approximately 560 linear feet of wetland habitat. No designated EFH is within the RWR.

Impacts from construction activities may affect aquatic fauna and fisheries, in small, localized areas (footprints of the piers and signage) these effects are expected to be minor and short term and temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby. The timing of any noise-producing activities would be planned to minimize disturbances to coastal-nearshore and marine life. Potential impacts to estuarine and aquatic fauna and managed fisheries would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna and managed species, as determined necessary by the Implementing Trustee. Trash management would be provided to minimize littering. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.11.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.11.3 SOCIOECONOMIC ENVIRONMENT

4.6.11.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a "disproportionately high and adverse" effect on a minority or low-income population. The alternative would not have a disproportionately adverse effect to these communities within Cameron and Vermilion Parishes and, in fact, would provide a net benefit to nearby communities by providing improved and increased access to recreational activities, including fishing.

4.6.11.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by foot, public education, and recreational use experience within the RWR. The proposed piers and signage would allow anglers, wildlife viewers, and others to better reach the Gulf of Mexico and other inland waters connecting to the Gulf of Mexico. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.11.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve existing infrastructure associated with recreational use by installing docks and signage within the RWR. Although the alternative would likely increase recreational use of the Refuge, traffic on nearby roads would not be anticipated to increase substantially over existing conditions and would result in long-term, negligible to minor effects.

4.6.11.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics of the site that make it eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the fishing piers and signage locations within the RWR. One cultural resources survey has been conducted within the RWR (Stopp 1976) and no cultural resources have been identified within the RWR. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.11.3.5 Land Use and Agricultural Resources

The alternative is consistent with existing land use as managed by LDWF. No adverse effect to current NPS management or land use would occur.

Agricultural lands are not present within the RWR; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.11.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve construction of new fishing piers and installation of signage. During construction, impacts on visual resources from the alternative would be minor, short term, and adverse, primarily because of the presence of construction personnel, equipment (e.g., fences, stockpiles), and vehicles visible to the public. Although the new fishing piers would alter the aesthetics of the alternative, it would improve access to the visual resources within the Refuge.

Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. Impacts from construction may be adverse, but localized, minor, and short term. Long-term impacts would be beneficial because improvements would enhance accessibility to visual resources.

4.6.11.5 PUBLIC HEALTH AND SAFETY

4.6.11.5.1 Noise

Noise associated with equipment during pier construction and signage installation would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, preparing the site, and pile installation. Implementation of the proposed improvements would include transportation of construction materials to the RWR, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

No human communities are located within the Refuge, nor would be affected by noise during construction of the alternative. Construction noise may be a nuisance to the public recreating adjacent to construction activities. Construction activities at the site would result in short-term, minor, adverse impacts to noise within the Refuge and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts from recreational use activities would likely be adverse but minor.

4.6.11.5.2 Resiliency

The resiliency of the proposed improvements to sustain sea-level rise, hurricanes, and storm surges would be determined during final design. To minimize adverse, minor, long-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- Avoiding the use of impervious materials as much as feasible.
- Minimizing the amount of clearing and exposed soil, would be implemented and maintained.

In addition, construction activities may temporarily impact the public health and safety.

4.6.12 St. Bernard State Park Improvements

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.12.1 PHYSICAL ENVIRONMENT

4.6.12.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include the construction of an event pavilion. Operation and maintenance of these facilities may also affect soils and substrates. Soils at the site include Aquent, dredged, frequently flooded; Clovelly muck; Cancienne silt loam, 0 to 1 percent; Carville, Cancienne, and Schriever soils, frequently flooded; Schriever clay, 0 to 1 percent slopes; Vacherie silt loam, gently undulating; and Westwego clay, none of which are highly erodible.

Grading and minor excavation may occur as part of the alternative. The existing pool deck would be demolished and the pool area filled in and used as the foundation for the proposed event pavilion. The extent of this work would depend on final design for this structure, but is expected to have minimal effects to surrounding areas.

Construction equipment for staging would likely include bulldozers and graders, a bobcat, and dump trucks. Staging is anticipated to occur within the St. Bernard State Park on existing parking areas. Construction of the event pavilion would impact soils and substrates within the footprint of the feature, which largely overlaps the footprint of the existing pool. Existing roadways and footpaths would be used to direct foot and vehicle traffic into designated areas resulting in negligible to minor, adverse impacts to the overall site during and after construction.

Minor, short-term disturbances to terrestrial soils and substrates may occur on-site from construction and site preparation activities. However, the impacts would be localized to small areas that may extend just outside of existing infrastructure footprints. Stockpiling of soils is not anticipated.

4.6.12.1.2 Hydrology and Water Quality

Ground disturbance as a result of demolition of the pool deck and construction of the event pavilion would include some filling and minor grading during site preparation and could result in sedimentation downhill. However, water bodies are not near the alternative elements; therefore, sedimentation in nearby receiving waters is not anticipated. The alternative would implement hydrology and water quality BMPs described in Section 4.3.1 to avoid and minimize potential effects to surrounding areas. Any potential minor effects would be short term and localized and would conclude once construction is completed. The only additional impervious surfaces that would be added to the site are from the areas of the proposed event pavilion that would extend beyond the existing pool footprint, which would be determined during E&D. However, this increase in impervious surface would be nominal, and effects from this additional impervious surface would not be noticeable in the setting of the state park. These minimal effects to water quality and hydrology would be negligible to minor but long term. Human waste from the renovated restroom facilities would continue to be managed within the existing park waste management infrastructure. The alternative does not include any in-water work. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for construction would be obtained as necessary. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.12.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, cranes, small excavators, fork lifts, roller, generators, small trucks, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use that may result, the potential increase in emissions would be nominal.

4.6.12.2 BIOLOGICAL ENVIRONMENT

4.6.12.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative includes upland-based activities to renovate the entrance station and restroom; the event pavilion and new restroom would occur at sites currently occupied by infrastructure. No in-water work is proposed for the alternative. The 358-acre site is currently managed as a state park that includes numerous recreational structures and associated infrastructure, as well as natural areas, including upland, wetland, and aquatic habitats. The primary impacts to the environment would be through the short-term effects of construction, including potential erosion and sedimentation, although none of the wetland areas are nearby proposed construction activities.

Proposed activities would occur in areas already disturbed and the immediate surrounding areas and would not be expected to affect habitats. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities. Therefore, the proposed new event pavilion would not be anticipated to have adverse, long-term effects on terrestrial habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. The state park currently implements trash management that includes a centralized dumpster repository as well as routine trash collection efforts. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.12.2.2 Protected Species

Protected Aquatic Species

The alternative would not include any in-water work and would be limited to uplands. No suitable marine, estuarine, or freshwater habitat is near the alternative; therefore, protected aquatic species are unlikely to be present. Effects to protected aquatic species would not be anticipated from the alternative.

Protected Terrestrial Species

All of the proposed construction associated with the alternative would occur in uplands within the existing 358-acre St. Bernard State Park. The proposed work does not occur in habitat that is optimal for the protected species that may occur in St. Bernard Parish, which include piping plover and red knot. Due to lack of suitable habitats in the alternative area, these protected terrestrial species are unlikely to be present, therefore effects to these species would not be anticipated.

Critical Habitat

Critical habitat is designated in St. Bernard Parish for Gulf sturgeon and piping plover. However, these areas not located near the alternative. Therefore, no effects to designated critical habitats would occur.

4.6.12.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative would occur within the existing state park that has been previously developed and managed for human and natural environment land uses. Several migratory bird species have the potential to occur within the alternative area. However, alternative would only occur within the footprint of existing infrastructure or in areas directly adjacent to park infrastructure. Vegetation clearing is unlikely

to occur and would be determined during E&D. If any vegetation clearing becomes necessary, best practices as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts to terrestrial wildlife and migratory birds. Therefore, adverse effects to these species would not be anticipated.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, bulldozers) is known to disturb migratory birds. These effects during construction would be minor and short term. Although a slight increase in recreational use of the park could result in a slight increase in long-term noise levels, these noise levels would be very similar to the baseline conditions and would be considered negligible. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction.

4.6.12.2.4 Marine and Estuarine Fauna

The alternative is not in or near coastal-nearshore or marine environments, would not include any in-water work, and is proposed entirely uplands. Therefore, effects to species in these habitats would not be anticipated. Trash management is actively managed at the St. Bernard State Park and would minimize littering.

4.6.12.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.12.3 SOCIOECONOMIC ENVIRONMENT

4.6.12.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a “disproportionately high and adverse” effect on a minority or low-income population. St. Bernard Parish is not considered a minority population compared to elsewhere in the state; however, this Parish is considered a low-income population. The alternative would not have a disproportionally adverse effect to these communities and, in fact, would provide a net benefit to nearby communities by providing improved and increased access to recreational activities.

4.6.12.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by car and foot to the recreational resources near the site. The proposed park facility improvements would allow wildlife viewers and others to better enjoy the natural resources and wildlife its extensive wetland habitats and the Mississippi River watershed. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.12.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve existing infrastructure associated with recreational use by renovating the existing entrance station and restroom and constructing a new event pavilion and restroom within the St. Bernard State Park. Although the alternative would likely increase recreational use of the park, traffic on nearby roads would not be anticipated to increase substantially over existing conditions.

4.6.12.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the improvements and of St. Bernard State Park. Cultural resources surveys have been conducted in portions of the park, including intensive investigations along either side of a hurricane protection levee that crosses south of the park (Heller et al. 2012; Flayharty and Muller 1982; R. Christopher Goodwin & Associates, Inc. 2008). No cultural resources have been identified within the park. As the park was not designated until 1971, none of the park resources could be considered historic. As such, renovations to the entrance facility, bathroom facilities, or swimming pool would not require cultural resources survey. Consultation with the Louisiana SHPO and tribes to determine any additional requirements may be necessary if any ground-disturbing activities are proposed outside the existing infrastructure footprints under the alternative.

4.6.12.3.5 Land Use and Agricultural Resources

The alternative site was acquired in 1971 by the State of Louisiana for the purpose of establishing the St. Bernard State Park. The alternative is consistent with existing land use in the area, is designated as a state park, and would not adversely affect current land use.

Agricultural lands are not present on the site; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.12.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve improvements to the existing campground facilities and recreational infrastructure, which would have a minor benefit to aesthetics of the park. During construction, impacts on visual resources from the alternative would be adverse, minor, and short term, primarily because of the presence of construction personnel, equipment (e.g., fences, stockpiles), vehicles, and unfinished structures visible to the public. Even though existing viewsheds would be temporarily affected, these impacts would not dominate the view or detract from current user activities or experiences.

Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. Overall, impacts from construction may be adverse, but localized, minor, and short term. No effects to the surrounding visual resources would be anticipated from the alternative. Overall long-term impacts would be beneficial, as improvements would enhance the park's aesthetics.

4.6.12.5 PUBLIC HEALTH AND SAFETY

4.6.12.5.1 Noise

Noise associated with equipment during construction of the new event pavilion and renovations of existing entrance station and restroom facilities would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, preparing the site, placing foundations, grading, and fill placement. Implementation of the alternative would include transportation of construction materials to the site, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

Human communities near the alternative may be affected by noise during construction of the proposed facilities. These activities are expected to be short term. Construction noise can also be a nuisance to residents living or recreating on the shorelines adjacent to construction activities. Construction activities at the site would result in minor, short-term, minor adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, increased recreational use by visitors may cause some noise associated with parking and recreating. Overall, minor, long-term noise impacts at the alternative from personal vehicle use and other recreational activities would likely be minor and adverse.

4.6.12.5.2 Resiliency

The alternative includes construction of a new event pavilion and renovations to the existing entrance station and restroom facilities. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design. To minimize adverse, minor, long-term impacts to this environmental resource, several mitigation measures would be employed:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety of the alternative site.

4.6.13 Cypremort Point State Park Improvements

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as

applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.13.1 PHYSICAL ENVIRONMENT

4.6.13.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include construction of a new marsh boardwalk and breakwater system, reinforcement of the rock jetty, and beach reclamation. Operation and maintenance of these facilities may also affect soils and substrates. Soils at the alternative include: Aqueuts, dredged, 1 to 5 percent slopes, occasionally flooded; Bancker muck, tidal; Clovelly muck, very frequently flooded; and Dupuy silt loam, 0 to 1 percent slopes, occasionally flooded. None of these soils are highly erodible.

In-water work would occur for construction of the proposed new marsh boardwalk and breakwater system, reinforcement of the existing rock jetty, and beach reclamation. The over-water area of the marsh boardwalk would be determined during E&D but would include a large portion of the approximately 3,000-foot-long proposed boardwalk/trail system. The construction of the marsh boardwalk would include placement of approximately 600 treated wooden piles into marsh sediments using a pile driver. Permanent substrate displacement and compaction from piling installation would result in minor, long-term effects. The size and depth of piles for the marsh boardwalk would be subject to final design and structural ability of the soil. In-water work associated with the jetty reinforcement would include the placement of medium to large-size rocks constituent with the existing jetty over a total length of approximately 4,400 feet along the north bank of Quintana Canal resulting in minor, long-term impacts to converted substrates. The overall area of this jetty would be subject to final design, but reinforcement would likely permanently alter the shoreline and substrates immediately surrounding this feature. In-water work associated with the proposed new breakwater system would include the placement of large to boulder-size rocks approximately 500 feet west of the coastline over a total length of approximately 2,100 feet, which would result in minor, long-term effects from permanent conversion of substrates. The crest of the rock groins would be 5 feet wide extending out in both directions to the sea floor. The overall area of the proposed breakwater system would be subject to final design. In-water work associated with the beach reclamation would be limited to the placement of new sand along the existing beach area that has been degraded from storms and wave forces. The overall beach area to be reclaimed is approximately 186,420 square feet. This work would include some replacement of the sub-soil where that has also been eroded. Approximately 8,630 cubic yards of sand would be placed along the beach area to a depth of 12 inches maximum. Overall, substrates and soils would be affected in the long term from beach reclamation. However, beneficial effects to soils and substrates would also be anticipated due to the reduction in erosion.

Road and parking repairs would be limited to the existing footprint of these features and would not likely alter current geological, soil, or substrate conditions in the terrestrial environment. Repaving of roads and parking areas would include repairs to the road base, as needed, and an asphalt overlay creating a 2-inch lift.

Construction equipment for staging would likely include bulldozers and graders, pile driving machinery, barge(s), a bobcat, and dump trucks. Staging is anticipated to occur within the Cypremort Point State Park on existing parking areas. Construction of the new boardwalk and breakwater system, reinforcement of the existing rock jetty, and reclamation of the beach would impact soils and substrates within the footprint of these features. Repairs to the roads and parking areas would not be expected to impact soils and substrates. Existing roadways and footpaths would be used to direct foot and vehicle traffic into designated areas, minimizing adverse impacts to the overall site during and after construction. In addition,

construction of the boardwalk would be conducted from upland areas or previously built sections of the boardwalk as construction progresses along the proposed trail, to the extent practical, reducing in-water work and soil disturbance.

Disturbances to terrestrial soils and substrates would be minor from the trail construction associated with the marsh boardwalk. However, short-term and long-term minor impacts to marine soils and substrates would occur from the placement of piles for the fishing pier construction and rocks for the jetty and breakwater construction, as well as placement of new sand for the beach reclamation. These impacts would be localized to several small areas across the Cypremort Point State Park area. Stockpiling of soils would not be needed for these elements. The placement of the rock jetties and breakwater system would likely have a long-term minor benefit to localized soils and substrates along the Cypremort Point State Park due to the jetty and breakwater system functions of protecting the coastline from further erosion and promoting sediment retention in areas inland from these proposed improvements. The proposed breakwater system would likely reduce existing erosion resulting in a benefit to geology and soils.

4.6.13.1.2 Hydrology and Water Quality

The alternative includes in-water work for construction of a new marsh boardwalk and breakwater system, reinforcement of the rock jetty, and beach reclamation. The alternative would implement hydrology and water quality BMPs described in Section 4.3.1 to avoid and minimize potential effects to receiving water bodies. However, these effects would be short-term, minor, and localized and would conclude once construction is completed. The area of impervious surfaces related parking areas and roadways within the Cypremort Point State Park would remain the same. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.13.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, small barges with crane, small excavators, fork lifts, roller, generators, small trucks, pile drivers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use that may result, the potential increase in emissions would be nominal.

4.6.13.2 BIOLOGICAL ENVIRONMENT

4.6.13.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative includes in-water work items for the construction of the new marsh boardwalk and breakwater system, reinforcement/extension of the existing rock jetty, and beach reclamation. Some upland-based work is also proposed for repairs of the existing roads and parking areas, as well as some

potential trail construction associated with the new marsh boardwalk. The 185-acre site is currently managed as a state park that includes numerous recreational structures and associated infrastructure, as well as natural areas, and includes natural areas of upland, wetland, and aquatic habitats. The primary impacts to the environment would be through the short-term effects of construction, including potential erosion and sedimentation, and permanent effects from placement of wooden piles and large rocks in marsh environment.

In-water work associated with the marsh boardwalk would consist of driving wooden piles into the estuarine marsh sediments and constructing over-water decking over portions of the proposed approximately 3,000-foot-long trail system with a width of approximately 4 or 5 feet. Construction of the breakwater system and reinforcement of the existing rock jetty would consist of placing medium to boulder-size rocks along approximately 4,400 feet of Quintana Canal and along approximately 2,100 feet about 500 feet west of the coastline in nearshore marine habitat around Cypremort Point State Park.

The construction of the marsh boardwalk would permanently alter the estuarine marsh area where the proposed system is placed and would potentially impact wetlands and some open water inlet areas because of increased human activities (e.g., shore-based fishing). Similarly, the construction of the proposed breakwater system and reinforcement of the existing rock jetty would permanently alter the nearby shoreline and open water areas where these elements are proposed because of the slight reduction in marine habitat from rock placement. Although these impacts would affect habitats in localized areas, the footprints of the boardwalk and rock placement are small, and the overall effects would be minor and long term. Short-term impacts to open water areas during construction of rock jetties, pile driving activities, and beach reclamation below the high tide line would result in short-term, minor impacts to terrestrial, nearshore, and marine habitats. The beach reclamation is intended to restore the previous functions of the beach area and would provide a net benefit to shoreline habitat for several bird and wildlife species. In addition, the road and parking area repairs would be limited to areas of existing infrastructure and would be unlikely to cause short-term, minor disturbances to surrounding natural areas. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities. Therefore, the alternative would not be anticipated to have adverse, long-term effects on terrestrial, estuarine, coastal nearshore, or marine habitats.

One of the primary alternative goals is to promote recreational fishing; therefore, an increase in fishing pressure would result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Parking capacity would limit the total number of visitors, thereby putting an upper limit on the magnitude of fishing pressure resulting from the alternative. The use of trawl gear or gillnets within the alternative is not expected. Although recreational fishing would increase from current levels, it is not expected to have long-term, substantive adverse effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. The state park currently implements trash management that includes a centralized dumpster repository as well as routine trash collection efforts. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.13.2.2 Protected Species

Protected Aquatic Species

The alternative includes in-water work in estuarine marsh and shoreline habitat. The alternative could have short-term, minor to moderate, adverse impacts to the following species: marine life stages of green, hawksbill, Kemp's Ridley, leatherback, and loggerhead sea turtles; the common bottlenose dolphin; and the West Indian manatee. The sea turtle species may occur in nearshore or inshore estuarine waters that contain seagrass or other submerged or emergent vegetation used as forage or may harbor prey species (NOAA Fisheries 2017). No large beds of SAV have been mapped within the alternative (Love et al. 2013; NOAA 2018); however, small patches of sea grass may be present. In the unlikely event that a sea turtle moves into the alternative area, impacts may include disturbance via noise, disorientation, or reduced visibility due to turbidity from dredging.

The West Indian manatee occurs in warm shallow estuarine waters adjacent to a freshwater source and with seagrass or other submerged or emergent vegetation for forage. Sightings of manatees in Louisiana riverine habitats are rare and likely occur in areas where submerged or emergent aquatic vegetation is available for forage (LDWF 2018). Due to the proximity of the alternative to marine habitats, the common bottlenose dolphin may also occur in the area. In the unlikely event that a manatee or dolphin is present during construction of the alternative, short-term impacts may include temporary disturbance via human activities, noise from dredging activities, avoidance due to temporary increased turbidity, and potential strikes from construction equipment.

Protected aquatic species in and around the alternative may be sensitive to changes in noise sources or levels related to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb fish and marine mammals, resulting in short-term, minor to moderate impacts. Conservation measures to protect marine mammals from noise are discussed in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A). The timing of in-water, noise-producing activities would be planned to minimize disturbances to marine life. BMPs, in addition to other avoidance and mitigation measures required by state and federal regulatory agencies, would minimize water quality impacts that could affect aquatic habitat. Because protected aquatic species are not likely to occur in the area, and because conservation measures would be implemented, no adverse, long-term impacts to protected aquatic species are anticipated.

Protected Terrestrial Species

Suitable habitat for the piping plover and red knot are present within the alternative. The species could use habitats within the alternative for foraging and roosting. Short-term, minor to moderate impacts to the piping plover and red knot could occur from increased human activity and construction noise along shorelines. These impacts would be localized and short term. If the piping plover or red knot are present during construction, the shorebirds would likely move to undisturbed habitat located adjacent to the alternative. Once short-term impacts from construction are completed, the shorebirds would once again use suitable habitat in the alternative site. Minor effects could include shoreline habitat modification at the small footprints of recreational improvements would occur throughout the larger WMA.

Protected terrestrial species in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb shorebirds resulting in short-term, minor to moderate impacts. If necessary, best practices as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts (DWH Trustees 2016). Additionally, all individuals working on the alternative construction would be provided with information in support of general awareness of piping plover and red knot presence and the means to avoid birds and

their critical or otherwise important habitats. The proposed construction work would avoid working during peak activities for these species to the maximum extent practicable. If work must be conducted when these species are present, construction workers would avoid working near concentrations of individuals or post avoidance areas to minimize disturbance.

Critical Habitat

Critical habitat for piping plover is designated in St. Mary and Iberia Parishes. However, these areas are not located near the alternative. Therefore, no effect to these designated critical habitats are anticipated.

4.6.13.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative would occur in an existing state park that is developed and managed for human and natural environment land uses (or in adjacent waters). Several migratory bird species have the potential to occur within the alternative. However, much of the proposed work would occur on existing roads and parking areas and would not involve any vegetation clearing. Some vegetation clearing may be required for construction of upland portions of the proposed marsh boardwalk/trail; however, these areas would be small and would not include the removal of trees. Best practices as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts to terrestrial wildlife and migratory birds. Therefore, adverse effects to these species would not be anticipated.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds resulting in short-term, minor to moderate impacts. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.6.13.2.4 Marine and Estuarine Fauna

In-water work associated with the marsh boardwalk would consist of driving wooden piles into the estuarine marsh sediments and constructing over-water decking over portions of the proposed approximately 3,000-foot-long trail system with a width of approximately 4 or 5 feet. Construction would consist of placing medium to boulder-size rocks along approximately 4,400 feet of Quintana Canal and along approximately 2,100 feet about 500 feet west of the coastline in nearshore marine habitat around Cypremort Point State Park.

Alternative elements would permanently impact the shoreline area and inland estuarine marsh where the boardwalk/trail system is proposed. Some increase in impacts to nearby shoreline and open water areas may occur as a result of increased human activities (e.g., shore-based fishing, litter). Although these impacts may affect aquatic fauna, fisheries, and EFH (present in the areas proposed for in-water work) in localized areas, the footprints of the marsh boardwalk and rock placements are small, and temporary disturbances are expected to be limited in scope and duration. Temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby. Therefore, the marsh boardwalk, breakwater system, and reinforced rock jetty would result in short-term, minor effects on aquatic fauna, local fisheries. Adverse, long-term effects to EFH would not be anticipated.

The timing of in-water, noise-producing activities would be planned to minimize disturbances to marine life. Potential impacts to estuarine and aquatic fauna, managed fisheries, and EFH would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna, EFH, and managed species, as determined necessary by the Implementing Trustee. Trash management is actively managed at the Grand Isle State Park and would minimize littering. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.13.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.13.3 SOCIOECONOMIC ENVIRONMENT

4.6.13.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a “disproportionately high and adverse” effect on a minority or low-income population. Although the St. Mary Parish is a minority population that is disproportionately more low-income than elsewhere in the state, the alternative would not have a disproportionately adverse effect to these communities and, in fact, would provide a net benefit to nearby communities by providing improved and increased access to recreational activities, including fishing.

4.6.13.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by car, boat, and foot to the recreational resources near the site. The proposed new marsh boardwalk breakwater system, reinforced rock jetty, and beach reclamation, as well as the repairs to roads and parking areas, would allow anglers, wildlife viewers, and others to better reach the Gulf of Mexico and other inland waters connecting to the Gulf of Mexico. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.13.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve existing infrastructure associated with recreational use by repairing existing roads and parking areas within the Cypremort Point State Park and providing a marsh boardwalk. Although the alternative would likely increase recreational use of the park, traffic on nearby roads would not be anticipated to increase substantially over existing conditions.

4.6.13.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the improvements and of Cypremort Point State Park. No cultural resources surveys have been conducted in any portion of the park, and no cultural resources have been identified within the park. Six known obstruction points have been identified in the waters within a 1-mile radius of the beach, suggesting a potential for submerged cultural resources. Despite the fact that the park was not designated until 2005, according to USGS topographic maps, the area was built up as "Cypremort Point Beach" prior to 1968, indicating that some of the existing structures at the park may be old enough to qualify as historic resources. Improvements to the rock jetties along the Quintana Canal and to the roads and parking lots would likely be within disturbed land and commensurate with existing impacts and would not likely require cultural resources survey. If impacts are expected outside of the existing disturbed area or for in-water structure placement, cultural resources may be affected if they are present. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.13.3.5 Land Use and Agricultural Resources

The alternative site was acquired in 2004 by the State of Louisiana for the purpose of establishing the Cypremort Point State Park. The alternative is consistent with existing land use in the area, is designated as a state park, and would not adversely affect current land use.

Agricultural lands are not present on the site; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.13.4 AESTHETICS AND VISUAL RESOURCES

During construction, impacts on visual resources from the alternative would be minor, short term, and adverse, primarily because of the presence of construction personnel, equipment (e.g., fences, stockpiles), vehicles, and unfinished structures visible to the public and recreational users. Construction activities could detract from the overall visual environment at the site, but these activities would be short term. Even though existing viewsheds would be temporarily affected, these impacts would not dominate the view or detract from current user activities or experiences.

Implementation of the alternative would change the current visual character of the coastal area by restoring the degraded beach area, constructing a new breakwater system, and installing a new marsh boardwalk; however, these elements would enhance much of the park aesthetics and improve access to existing visual resources. The remainder of the elements would not adversely affect the site, which primarily consists of access roads and parking lots, because these features would largely remain the same. The alternative's elements would not be out of character with previous site conditions and use. Views of the site and the surrounding areas would not noticeably change from the implementation of the alternative.

4.6.13.5 PUBLIC HEALTH AND SAFETY

4.6.13.5.1 Noise

Noise associated with equipment during construction of a breakwater system and marsh boardwalk, reinforcement of the existing rock jetty, beach reclamation, and repairs to existing roads and parking areas would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, pile installation, asphalt laying, grading, rock armor placement, and sand placement. Implementation of the alternative would include transportation of construction materials to the site, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

Human communities near the alternative may be affected by noise during construction of the proposed facilities. These activities are expected to be short term. Construction noise can also be a nuisance to residents living or recreating on the shorelines adjacent to construction activities. Construction activities at the site would result in short-term, minor, adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, increased recreational use by visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts at the alternative from personal vehicle use, fishing, and other recreational activities would likely be minor and adverse.

4.6.13.5.2 Resiliency

The alternative includes construction of a breakwater system and marsh boardwalk, reinforcement of the existing rock jetty, beach reclamation, and repairs to existing roads and parking areas. The proposed marsh boardwalk was developed in response to resiliency concerns over replacing the existing fishing pier in its current location. Reinforcement of the existing inadequate rock jetty would help stabilize the sides of Quintana Canal and Beach Lane to reduce erosion. In addition, the proposed breakwater system and beach reclamation elements would recover the beach area from degradation and help to withstand wave forces and reduce future beach erosion issues. The existing roads and parking areas would be lifted by 2 inches to address current flooding issues and damages from previous floods. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be further determined during final design. To minimize adverse, long-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.14 The Wetlands Center

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as

applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.14.1 PHYSICAL ENVIRONMENT

4.6.14.1.1 Geology and Substrates

The Jefferson Parish contains poorly drained, low erodibility, silty loam soils. No surface disturbance would be required for development and installation of Wetlands Center exhibits and theater. However, if a portion of NRDA funds was used to support construction of the Wetlands Center, an estimated 0.77 acre of vegetation clearing would be required within the footprint of the entry promenade, deck, and Center building and surrounding construction buffer. Approximately 0.5 acre of clearing would be permanent. The remaining 0.27 acre of clearing would be short term and revegetated upon completion of construction. This construction activity would result in minor, short-term and long-term disturbance, displacement, and/or compaction of soils and substrates. Excavated soils would be stockpiled on-site in order to reclaim and revegetate areas disturbed but not needed long term.

4.6.14.1.2 Hydrology and Water Quality

No surface disturbance would be required for development and installation of the Wetlands Center exhibits and theater. However, if a portion of NRDA funds was used to support construction of the Wetlands Center, and it is assumed that all lands on the floodside of the tidal levee are jurisdictional waters of the U.S. or wetlands, an estimated 0.77 acre of emergent wetland vegetation and wetland forest vegetation would be cleared during construction, which could result in short-term, minor impacts from sedimentation to area waters.

Because all of the structures would be pier supported, with the exception of the polyacrylic tank, only the footprints of the piers and polyacrylic tank walls would be considered placement of fill material impacting water-bottoms/wetlands. Given the estimated size and number of piers (52 8-inch diameter piers and 16 18-inch piers), approximately 0.001 acre of water-bottom would be filled with piers would be permanently affected. Additionally, 0.07 acre of wetland would be enclosed by the construction of the retainer tank adjacent to the Wetlands Center. Because of the small size, long-term impacts would be minor.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include all specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.14.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, cranes, small excavators, fork lifts, roller, generators, small trucks, pile drivers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts could include a slight increase in emissions from the increase in recreational use of the site; however, residents already use the adjacent Nature Study Trail and Multipurpose Resource Facility, therefore, the potential increase in emissions would be negligible.

4.6.14.2 BIOLOGICAL ENVIRONMENT

4.6.14.2.1 Terrestrial, Coastal-Nearshore, and Marine Habitats

The alternative site is currently undeveloped, and the activities of the alternative would take place in bald cypress wooded marsh habitat. The environment surrounding the alternative is transitional mix of estuarine and freshwater habitats, consisting of bald cypress woodland marsh and ridges of American persimmon (*Diospyros virginiana*), swamp red maple (*Acer rubrum*), pumpkin ash (*Fraxinus profunda*), and buttonbush (*Cephalanthus occidentalis*), flanked by wax myrtle shrub marsh-surrounded estuarine canals with adjacent residential development (Hop et al. 2017). Freshwater ponds and associated herbaceous marshes are also present in the vicinity (USFWS 2017b). No marine habitat is present.

The primary impacts to terrestrial and coastal-nearshore habitats would be through habitat removal or modification, such as increased sedimentation. An estimated 0.77 acre of vegetation clearing would be required within the footprint of the entry promenade, deck and Center building and surrounding construction buffer. Approximately 0.5 acre of clearing would be permanent. The remaining 0.27 acre of clearing would be short term and revegetated upon completion of construction. Although these impacts would reduce or modify habitats in localized areas, the permanent footprint would be negligible, resulting in minor effects. Wildlife would likely use plentiful suitable habitats nearby. Therefore, the alternative would not be anticipated to have adverse, long-term effects on terrestrial or coastal nearshore habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.14.2.2 Protected Species

Protected Aquatic Species

As the alternative consists of woodland marsh habitats (USFWS 2017b) and although estuarine habitat is present near the alternative (the California County Canal), based on the NOAA Data Atlas (NOAA 2018) and the Gulf of Mexico Ecosystem Atlas (Love et al. 2013), it is highly unlikely that SAV habitat is present at the alternative. Therefore, the alternative would not be anticipated to have adverse effects on protected aquatic species.

Protected Terrestrial Species

Piping plover and red knot both require estuarine shores (NatureServe 2016), which are not found within or near the alternative. The closest suitable habitat for these species is located more than 1 mile west of the alternative, on the shores of Lake Salvador. Therefore, the alternative would not be anticipated to have adverse effects on protected terrestrial species.

Critical Habitat

No critical habitat for any protected species is located within the alternative; therefore, the alternative would not be expected to have adverse effects to designated critical habitat.

4.6.14.2.3 Terrestrial Wildlife, including Migratory Birds

No surface disturbance would be required for development and installation of the Wetlands Center exhibits and theater. However, if a portion of NRDA funds was used to support construction of the alternative would clear a 0.77-acre undeveloped site and therefore could affect terrestrial wildlife. Potential effects from construction include removal of foraging, nesting, or other habitat; disturbance from noise during and after construction; and erosion and sedimentation of aquatic areas near construction that terrestrial species rely on for foraging or resting. However, the alternative does not specifically provide any special breeding, roosting, or foraging habitat for terrestrial wildlife.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds resulting in short-term, minor to moderate effects. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions; however, the site's proximity to the Nature Study Trail and Multipurpose Resource Facility may render these increases negligible. As previously discussed, the alternative would include BMPs described in Section 4.3.1 and the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would therefore be minimal.

4.6.14.2.4 Marine and Estuarine Fauna

No marine habitat or EFH is present. Therefore, marine species would not be adversely affected by the alternative. Construction activities would result in disturbances (e.g., sedimentation, noise from in-water construction) to nearshore species. These effects would be minor and short term because suitable habitat is present in the adjacent areas. The timing of in-water, noise-producing activities would be planned to minimize disturbances to other aquatic species. Potential impacts to aquatic fauna would be considered and avoided or minimized to the extent practicable during design and construction. When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna and managed species, as determined necessary by the Implementing Trustee. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.14.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.14.3 SOCIOECONOMIC ENVIRONMENT

4.6.14.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a "disproportionately high and adverse" effect on a minority or low-income population. Although the alternative is located in Jefferson Parish, which contains a minority and low-income population, the alternative would not have a disproportionately adverse effect to these communities and, in fact, could provide a net benefit to local residents by providing additional public education and outreach opportunities.

4.6.14.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would improve recreational use by providing a new Wetlands Center with observation desks and a promenade for passive recreation and wildlife viewing. Indirectly, improved public connectedness to Gulf Coast resources could draw new visitors and residents to the region, thereby increasing recreation and tourism activity long term.

4.6.14.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve infrastructure associated with recreational use by providing a new Wetlands Center with observation desks and a promenade for passive recreation and wildlife viewing. Although the alternative would provide additional recreation and educational opportunities, traffic on nearby roads would not be anticipated to increase substantially over existing conditions. Indirectly, improved public connectedness to Gulf Coast resources could draw new visitors and residents to the region, thereby increasing demand for recreational access and facilities over time.

4.6.14.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of planned additions to the Wetlands Education Center. A previous cultural resources survey encompasses the alternative; however, intensive investigations were not conducted near the alternative (Santeford et al. 1996). No previously identified cultural resources are recorded in the vicinity. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.14.3.5 Land Use and Agricultural Resources

The alternative was identified in the Jean Lafitte Wetlands Education Center Master Plan for the purpose of providing educational and recreational opportunities. It is consistent with existing land use in the area, and would not adversely affect current land use.

Agricultural lands are not present on the alternative; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.14.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve the construction of a wetlands center, including the construction of an entry promenade and surrounding decks. During construction, impacts on visual resources from the alternative would be minor and adverse, primarily because of the presence of construction personnel, equipment (e.g., fences, stockpiles), vehicles, and unfinished structures visible to the public.

After construction, the Wetlands Center would be a new facility within a previously undeveloped area. The new recreational facility would be seen from adjacent public roads and recreational facilities, and some viewers may consider the new facility as an adverse, long-term change in the view. Conversely, the Wetlands Center would also improve the public's access to natural visual resources. Long-term impacts to visual resources could be considered adverse or beneficial, depending on the viewer. These impacts would be localized and minor.

4.6.14.5 PUBLIC HEALTH AND SAFETY

4.6.14.5.1 Noise

Noise associated with equipment during construction of the Center (including placement of new piles), would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, preparing the site, pile installation, placing foundations, grading, and fill placement. Implementation of the alternative would include transportation of construction materials to the site, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

Residents or visitors near the alternative may be affected by noise during construction of the proposed facilities. Construction activities at the site would be expected to result in short-term, minor adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts at the alternative from personal vehicle use, boating, fishing, and other recreational activities would likely be minor and adverse.

4.6.14.5.2 Resiliency

The alternative could include construction of the Wetlands Center and promenade. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design. To minimize adverse, long-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.15 Recreational Use Improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.15.1 PHYSICAL ENVIRONMENT

4.6.15.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include reconstruction of the VC Trail and installation of seven wayside exhibits. Operation and maintenance of these facilities may also affect soils and substrates. Soils within the Preserve include Allemands muck, 0 to 0.2 percent slope; Barbary muck, 0 to 1 percent slope; Cancienne silty clay loam; and Schriever clay, 0 to 1 percent slopes. Soils are frequently flooded, poorly drained, and slightly erodible.

Generally, trail improvements would be limited to the existing footprint and would not likely alter current geological, soil, or substrate conditions in the terrestrial environment. Trail repairs would be limited to replacement of the current wooden pilings, wooden substructure and decking, with new pilings, substructure, decking and railings using materials that are more sustainable and environmentally neutral. Wayside exhibit installation would occur in the existing footprint of current signage and in new areas within trail disturbance areas. Limited alteration of geological, soil, or substrate conditions in the terrestrial environment is anticipated from the installation of seven wayside exhibits.

Existing roadways and footpaths would be used to direct foot and vehicle traffic into designated areas, minimizing adverse impacts to the overall site during and after construction. The alternative would require a staging area that uses heavy equipment. Short-term disturbances to terrestrial soils and substrates may occur on-site from construction and site preparation activities. However, the impacts would be localized to the corridor of the existing VC Trail and seven small areas along the VC Trail for the wayside exhibits and short-term and long-term effects would be considered minor. Any excavated soils would be minimal and would be stockpiled on-site in order to reclaim and revegetate disturbed areas that are not needed for development of the alternative.

4.6.15.1.2 Hydrology and Water Quality

Although the alternative would minimize in-water work for construction associated with the trail and signage improvements, limited in-water work including placement of pilings, possible equipment access, and vegetation removal may be encountered within and along the existing trail corridor. Localized sedimentation and increased turbidity of local water bodies could occur during construction. These adverse effects to hydrology and water quality would be minor, short term, and localized, and would conclude once construction is completed. The area taken up by impervious surfaces within the Preserve would not change as a result of the alternative. Further evaluation of potential impacts to stormwater and pollutant loads would be completed during E&D, and additional measures to avoid or minimize could be developed.

Prior to construction, federal and state permits for any in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.15.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as trucks, backhoes, tractor trailers, small excavators, fork lifts, rollers, generators, pile drivers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of construction, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use that may result from the trail improvements, the potential increase in emissions would be minimal.

4.6.15.2 BIOLOGICAL ENVIRONMENT

4.6.15.2.1 Terrestrial, Coastal-Nearshore, and Marine Habitats

The alternative would include upland-based recreation enhancements, though in-water work may occur in bayous and some flooded areas. The approximately 22,000-acre Preserve includes numerous recreational structures and associated infrastructure, as well as natural areas of upland, wetland, and other aquatic habitats. The primary impacts to the biological environment would be through the short-term effects of construction, including potential erosion and sedimentation, and permanent effects from placement of signage, pilings, substructure, decking and railings for trail improvements. These effects would be minor and short term.

The alternative would be limited to areas of existing infrastructure and would be unlikely to cause disturbances to surrounding natural areas. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities. The alternative is not anticipated to have adverse, long-term effects on terrestrial, coastal nearshore, or marine habitats.

One of the primary goals of the alternative is to promote recreational use within the Preserve; therefore, an increase in public use may occur. Existing parking limits the current capacity of the Preserve, thus limiting the total number of visitors and thereby putting an upper limit on the magnitude of recreational use pressure resulting from the alternative. Although recreational use may increase from current levels, it is not expected to have substantive adverse effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. The park currently implements trash management that includes a centralized dumpster repository as well as routine trash collection efforts. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.15.2.2 Protected Species

Protected Aquatic Species

Although the alternative would minimize in-water work for construction associated with the trail and signage improvements, limited in-water work may be encountered within and along the existing trail corridor. Although some suitable estuarine habitat is present within the Preserve, protected species that rely on these habitats are unlikely to be present. Therefore, effects to protected aquatic species would not be anticipated.

Protected Terrestrial Species

All of the alternative activities located in terrestrial environments would be limited to existing park infrastructure in uplands. Piping plover and red knot both require estuarine and marine shores found within Jefferson Parish. No known occurrence of these species has been documented in the Preserve (NPS 2018) and the alternative is not proposed in suitable habitat for these species.

Critical Habitat

No critical habitat for any protected species is located within the park; therefore, the alternative would not be expected to have adverse effects to designated critical habitat.

4.6.15.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative features would occur within an existing park that has been previously developed and managed for human and natural environment land uses. Several migratory bird species have the potential to occur within the area. However, the alternative terrestrial elements would only occur within previously constructed trail corridors and would involve little, if any, vegetation clearing. Best practices as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts to terrestrial wildlife and migratory birds. Therefore, adverse effects to these terrestrial wildlife and migratory birds would not be anticipated.

4.6.15.2.4 Marine and Estuarine Fauna

In-water work associated with the VC Trail replacement would consist of replacing the current wooden pilings, wooden substructure, and decking, with new pilings, substructure, decking, and railings using materials that are more sustainable and environmentally neutral. All construction would occur within the existing corridor of the VC Trail; therefore, limited vegetation removal would be anticipated. No designated EFH is within the Preserve.

The alternative would be within and along an existing trail corridor system managed by NPS. No additional impact to coastal-nearshore habitats would be anticipated because of increased human activities (e.g., shore-based fishing, litter). Although these impacts may affect aquatic fauna and fisheries, in localized areas, the footprints of the trail and wayside exhibits are small and similar to existing in-water structures, and temporary disturbances are expected to be limited in scope and duration. Temporarily disturbed aquatic fauna would likely find refuge in suitable habitats nearby. Therefore, effects would be minor and short term. The timing of any noise-producing activities would be planned to minimize disturbances to coastal-nearshore and marine life. Potential impacts to estuarine and aquatic fauna and managed fisheries would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna and managed species, as determined necessary by the Implementing Trustee. Trash management would be provided to minimize littering. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.15.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.15.3 SOCIOECONOMIC ENVIRONMENT

4.6.15.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a "disproportionately high and adverse" effect on a minority or low-income population. Although the Jefferson Parish is a minority population that is disproportionately more low-income than elsewhere in the state, the alternative would not have a disproportionately adverse effect to these communities and, in fact, would provide a net benefit to nearby communities by providing improved and increased access to recreational activities.

4.6.15.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by foot, public education, and recreational use experience within the Preserve. The alternative would allow wildlife viewers and others to enjoy the recreational opportunities at the park in a safe manner. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.15.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other major infrastructure. The alternative would improve existing infrastructure associated with recreational use by replacing this existing boardwalk trail and some of the signage within the Preserve. Although the alternative would likely increase recreational use of the park, traffic on nearby roads would not be anticipated to increase substantially over existing conditions.

4.6.15.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics of the site that make it eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the park improvements. Portions of the Barataria Preserve Unit of the Jean Lafitte National Historical Park and Preserve (JLNHPP) have been listed on the NRHP since 1989 (Holmes 1988). A number of cultural resources surveys and assessments were conducted within the JLNHPP in 1982, 1986, 1987, and 1988 (Beavers et al. 1982; Franks et al. 1988; Holmes 1986; Poplin 1987; Speaker et al. 1986; Swanson 1988; and Yakubik et al. 1989) culminating in the nomination of the Historic District to the NRHP. The district encompasses at least 84 cultural resource sites (63 of which contribute to its eligibility for the NRHP), including prehistoric shell middens and mound sites dating from the Tchefuncte to Plaquemines periods, Colonial period roads, Canary Islander settlements, and nineteenth-century sugar plantations and cypress logging camps (Holmes 1988). Most of these sites lie on the natural levee of Bayou des Familles and Bayou Barataria and the shores of Lake Salvador. Consultation with the Louisiana SHPO and tribes by the NPS would occur prior to any ground-disturbing activities under the alternative to determine any additional requirements for the protection of cultural resources.

4.6.15.3.5 Land Use and Agricultural Resources

The alternative is within the Barataria Preserve Unit, one of the original components within the park established in 1978. The alternative is consistent with existing land use as managed by NPS in the Preserve. No adverse effect to current NPS management or land use would occur.

Agricultural lands are not present within the Preserve; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.15.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve replacing and enhancing the existing trail, which would have a minor benefit to aesthetics of the site. Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. No long-term impacts to the surrounding visual resources would be anticipated from the alternative.

4.6.15.5 PUBLIC HEALTH AND SAFETY

4.6.15.5.1 Noise

Noise associated with equipment during trail and wayside exhibit construction would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, preparing the site, pile installation, grading, and fill placement. Implementation of the alternative would include transportation of construction materials to the trail corridor, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

Human communities are not located within the Preserve and would not be affected by noise during construction of the alternative. Construction noise may be a nuisance to the public recreating adjacent to construction activities. Construction activities at the site would result in short-term, minor, adverse impacts to noise within the Preserve and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts from recreational use activities would likely be minor and adverse.

4.6.15.5.2 Resiliency

The alternative includes improvement of an existing trail and wayside exhibits throughout the Preserve. The improvements associated with the VC Trail addresses NPS's need for Preserve access to be ADA compliant, resilient to flooding, and safer than the current trail system. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be further determined during final design. To minimize adverse, long-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety within the Preserve.

4.6.16 Des Allemands Boat Launch

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.16.1 PHYSICAL ENVIRONMENT

4.6.16.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include construction of the parking lots, roadways, pavilions, boat ramp, floating and wooden docks, and footpaths. Operation and maintenance of these facilities may also affect soils and substrates. Soils at the alternative are primarily Harahan clays, which are very poorly drained and only slightly erodible.

In-water work is expected because of the construction of the boat launch, docks, maneuvering area, and fishing pier. Wooden dock construction would include placement of new treated wooden piles using an impact pile driver. Substrate displacement and compaction from piling installation would result. The number, size, and depth of piles for the wooden dock would be subject to final design, although it is expected that less than 100 square feet total of substrate would be displaced in the aquatic environment. In-water work associated with the boat launch and maneuvering area is estimated to be 17,000 square feet. Sidewalls would be placed along the boat launch, maneuvering area, and fishing pier using coated steel sheet pile installed using heavy equipment to drive it below the surface vertically along the sides of the boat ramp to prevent erosion and to provide long-term stability. Total in-water work area is estimated to be 23,500 square feet (0.54 acre).

Construction of the parking area, boat launch, maneuvering area, docks, pavilion, restroom, and walkways would impact soils and substrates within the footprint of each feature. Roadways and walkways have been sited to direct foot and vehicle traffic into designated areas, minimizing adverse impacts to the overall site.

Short-term, minor, impacts to terrestrial soils and substrates would occur on-site from construction and site preparation activities. However, the impacts would be localized to several small areas across the alternative. The site is currently undeveloped; therefore, placement of alternative features would permanently convert soils and substrates in the proposed footprints. It is anticipated that areas not necessary for complete buildout of the Des Allemands Boat Launch and associated facilities may be disturbed during construction. Excavated soils would be stockpiled on-site in order to reclaim and revegetate disturbed areas that are not needed for alternative features.

4.6.16.1.2 Hydrology and Water Quality

The alternative includes in-water work for construction of the boat launch, maneuvering area, docks, and fishing pier. Additionally, ground disturbance as a result of excavation and grading during construction could result in sedimentation entering the surrounding waterway. The alternative would implement hydrology and water quality BMPs as described in Section 4.3.1 to avoid and minimize potential effects to receiving water bodies. However, these effects would be minor, short term, and localized and would conclude once construction is completed. The permanent increase in impervious surfaces for parking areas and roadways may increase sedimentation and stormwater runoff into the receiving water body. These effects to water quality and hydrology would be long term and localized, but minor due to the small size of the alternative. Users of the boat launch have potential to increase the release of fuel and other effluents into the receiving water body. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.16.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, cranes, small barges with crane, small excavators, fork lifts, roller, generators, small trucks, pile drivers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use that may result from a larger parking area for cars and trailers, the potential increase in emissions would be nominal.

4.6.16.2 BIOLOGICAL ENVIRONMENT

4.6.16.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative features under consideration include upland-based items such as road, parking area, walkway, and pavilion construction. Some in-water work is also proposed for construction of the boat launch, maneuvering area, docks, and fishing pier. The alternative is currently undeveloped, though it had previously been under agricultural use. The alternative would take place in upland, wetland, or riverine habitats. The primary impacts to the environment would be through the short-term effects of construction, including potential erosion and sedimentation.

In-water work associated with the boat launch and maneuvering would consist of placing concrete, sand, and crushed stone, as well as coated steel sheet pile in the waterway. Construction of the fishing pier would require removal of vegetation along 95 linear feet of shoreline. Vegetation would be removed from an additional 260 linear feet of shoreline to create the boat ramp and maneuvering area. The shoreline in this location is associated with, and adjacent to, the levee. The wooden docks and fishing pier would require the driving of approximately 70 piles into the substrate, assuming 10-foot spacing.

The creation of the boat launch would permanently impact the shoreline area where the ramp, maneuvering area, docks, and fishing pier are placed and would potentially impact nearby shoreline and open water areas because of increased human activities (e.g., boat traffic, litter). Although these impacts would affect habitats in localized areas, the permanent footprint of the ramp, maneuvering area, docks, and fishing pier are relatively small (0.6 acre) and would be minor. Temporary disturbances are expected to be limited in scope and duration during construction and would be considered minor. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities. Therefore, the boat launch ramps, maneuvering area, docks, and fishing pier would not be anticipated to have adverse, long-term effects on terrestrial, coastal nearshore, or marine habitats.

One of the primary alternative goals is to promote recreational fishing; therefore, an increase in fishing pressure would result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Parking capacity would limit the total number of visitors, thereby putting an upper limit on the magnitude of fishing pressure resulting from the alternative. The use of trawl gear or gillnets within the alternative is not expected. Although recreational fishing would increase from current levels, it is not expected to have long-term, substantive, adverse effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.16.2.2 Protected Species

Protected Aquatic Species

Based on consultation with USFWS, no protected aquatic species have been identified in the alternative's footprint; therefore, no adverse impacts to protected aquatic species are anticipated.

Protected Terrestrial Species

Based on consultation with USFWS, no protected terrestrial species have been identified in the alternative's footprint; therefore, no effects to protected terrestrial species are anticipated.

Critical Habitat

No critical habitat has been identified near the alternative; therefore, the alternative would not be expected to have adverse effects to designated critical habitat.

4.6.16.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative features would occur along an undeveloped shoreline environment, and therefore may affect terrestrial wildlife, migratory birds, and bald eagles known to occur in the area. Some of the 15-acre site would be permanently converted from undeveloped vegetated areas to parking areas, roadways, outbuildings, and walkways. The land-based construction effort would require minimal tree clearing due to the low tree density within the alternative. These trees may provide some roosting and foraging habitat for certain species, but that function is not anticipated to be adversely affected. Additionally, the bank along which the boat ramp would be constructed does not specifically provide any special breeding, roosting, or foraging habitat for any of the listed species, therefore no adverse effects are anticipated due to the alternative.

Terrestrial wildlife, including bald eagles, in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds, resulting in short-term, minor to moderate impacts. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions; however, the site's proximity to waterway traffic may render these increases negligible. As previously discussed, the alternative would include BMPs described in Section 4.3.1 and the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.6.16.2.4 Marine and Estuarine Fauna

Designated EFH is present within the alternative. Although the impacts from in-water work may affect aquatic fauna, local fisheries, and EFH near the alternative, the overall footprint is relatively small, and temporary disturbances are expected to be minor and short term because they are limited in scope and duration. Temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby.

The timing of in-water, noise-producing activities would be planned to minimize disturbances to marine life. Potential impacts to estuarine and aquatic fauna, managed fisheries, and EFH would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna, EFH, and managed species, as determined necessary by the Implementing Trustee. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.16.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.16.3 SOCIOECONOMIC ENVIRONMENT

4.6.16.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a “disproportionately high and adverse” effect on a minority or low-income population. St. Charles Parish has fewer minority and low-income populations than in the State of Louisiana. Additionally, less than 40% of the population is reported as minority and less than 20% is considered low income. Therefore, the alternative would not have a disproportionately adverse effect on the Parish and, in fact, would provide a net benefit by providing improved and increased access to recreational activities, including fishing.

4.6.16.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by car and boat to the recreational resources near the site. The proposed construction of boat launch, parking areas, docks, fishing pier, and pavilion would allow anglers, wildlife viewers, and others to better reach Bayou Des Allemands and other waterways connecting to the Gulf of Mexico. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.16.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve infrastructure associated with recreational use by providing a new boat launch with increased parking areas as well as docks, fishing pier, and pavilion for passive recreation and wildlife viewing. Although the alternative would provide an additional opportunity for water-based recreation in the vicinity, traffic on nearby roads, include Louisiana Highway 632, would not be anticipated to increase substantially over existing conditions.

4.6.16.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics of the site that make it eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the alternative. No previous cultural resources surveys and no cultural resources have been identified within the footprint of the alternative. According to USGS topographic maps, the levee along Bayou Des Allemands / Petit Lac Des Allemands was built between 1932 and 1940, suggesting that there may be a potential for very recent historic resources along the levee. Apart from agricultural use of the property, no other potential impacts to cultural resources have been recorded. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.16.3.5 Land Use and Agricultural Resources

The alternative was contracted under agreement in 2012 for the purpose of installing a new boat launch and associated facilities. Access to the water for fisheries is consistent with existing land use in the area. The St. Charles Parish Comprehensive Land Use Plan identifies the existing land use for the alternative location as wetlands and other natural resources (St. Charles Parish 2011:53). The 15-acre alternative would not conflict with the existing land use of the area.

The alternative, although previously used for agriculture, is not currently under agricultural use. Therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.16.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve construction of recreational facilities such as boat launches, parking areas, access road, and docks. During construction, impacts on visual resources at the alternative would be adverse, minor, and short term, primarily because of the presence of construction personnel, equipment (e.g., fences, stockpiles), vehicles, and unfinished structures visible to the public.

After construction, the alternative would be a new facility within a previously undeveloped area. The new recreational area would be seen from adjacent public roads and waterbodies, and some viewers may consider the new facility as an adverse, long-term change in the view. Conversely, the alternative would also improve the public's access to natural visual resources. Long-term impacts to visual resources could be considered adverse or beneficial, depending on the viewer. These impacts would be localized and minor.

4.6.16.5 PUBLIC HEALTH AND SAFETY

4.6.16.5.1 Noise

Noise associated with equipment during construction of the docks (including placement of new piles), boat launch, maneuvering area, parking area, roadways, pavilion, restroom, and walkways would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, preparing the site, installing piles, placing foundations, grading, and placing fill. Implementation of the alternative would include transportation of construction materials to the site, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

No human communities are in close proximity to the alternative. The nearest residence is over 0.25 mile away. Residents or persons recreating on the shorelines adjacent to construction activities could be affected by noise during construction of the proposed facilities. Construction activities at the site would result in short-term, minor, adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts at the alternative from personal vehicle use, boating, fishing, and other recreational activities would likely be adverse but minor.

4.6.16.5.2 Resiliency

The alternative includes construction of a boat ramp, wooden dock, and floating dock. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design. To minimize adverse, long-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.17 Middle Pearl

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.17.1 PHYSICAL ENVIRONMENT

4.6.17.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include enhancement of the existing parking lot, access roadway, boat ramp, and wooden docks. Operation and maintenance of these facilities may also affect soils and substrates. Soils at the alternative are primarily Aquents, dredged, which are classified as very poorly drained and not rated for erodibility.

In-water work is expected because of the construction of the boat launch and docks. The over-water area of the docks and floating piers is estimated to total approximately 2,880 square feet. Wooden dock construction would likely include placement of new treated wooden piles using a pile driver. Substrate displacement and compaction from piling installation would result. The number, size, and depth of piles for the wooden dock would be subject to final design, although it is expected that less than 60 square feet total of substrate would be displaced in the marine environment, assuming 1 square foot of disturbance per pile. In-water work associated with the boat launch is estimated to be 2,925 square feet. The in-water work would primarily consist of the placement of concrete, sand, and crushed stone. Sidewalls, typically constructed of sheet pile, would be placed along the boat launch using heavy equipment to drive it below the surface vertically along the sides of the ramp to prevent erosion and to provide long-term stability. Total in-water work area is estimated to be 6,000 square feet.

Excavation would occur along the riparian area for the boat launch and docks, and in the terrestrial environment for the parking lots for cars, trucks, and trailers and access roads. The depth of ground disturbance and excavation would depend on final design for the boat launch, slip, and docks. For the parking areas and roadways, depth is expected to be less than 6 inches.

Construction of the parking area, boat launch, and docks would impact soils and substrates within the footprint of each feature. The access road has been sited to follow existing access, and to direct foot and vehicle traffic into designated areas, minimizing adverse impacts to the overall site.

Short-term disturbances to terrestrial soils and substrates would occur from construction and site preparation activities. However, the impacts would be localized to several small areas across the alternative and therefore would be minor. The site is currently developed as an existing boat launch; therefore, it is anticipated that areas not necessary for buildout of the alternative would not likely be disturbed during construction. Excavated soils would be stockpiled on-site in order to reclaim and revegetate disturbed areas that are not needed for alternative features or hauled off to an approved site.

4.6.17.1.2 Hydrology and Water Quality

The alternative includes in-water work for construction of the boat launch, docks, and slip. Additionally, ground disturbance because of excavation and grading during construction could result in sedimentation entering the surrounding waterway. The adverse effects would be localized, minor, and short term and would conclude once construction is completed. The introduction of impervious surfaces for parking areas and roadways may increase sedimentation and stormwater runoff into the receiving water body. These effects to water quality and hydrology would be long term, but minor due to the small size of the alternative and the use of an existing boat launch footprint. Users of the boat launch have potential to increase the release of fuel and other effluents into the receiving water body. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.17.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, cranes, small barges with crane, small excavators, fork lifts, roller, generators, small trucks, pile drivers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts might include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use that may result from improved facilities, the potential increase in emissions would be nominal.

4.6.17.2 BIOLOGICAL ENVIRONMENT

4.6.17.2.1 Terrestrial, Coastal-Nearshore, and Marine Habitats

The alternative features under consideration include upland-based items such as an access road and parking area. Some in-water work is also proposed for construction of the boat launch and docks. The 1-acre site is currently developed for use as a boat launch and parking. The alternative would take place in upland, wetland, or aquatic habitats. The primary impacts to the environment would be through the short-term effects of construction, including potential erosion and sedimentation.

In-water work associated with the boat launch would consist of placing concrete, sand, and crushed stone, as well as sheet pile in the waterway. No riparian vegetation is anticipated to be removed from the shoreline to create the boat ramp because the alternative involves the replacement of an existing boat ramp. The wooden docks would require the driving of 60 piles into the substrate, which would permanently convert the substrate, resulting on minor, long-term effects.

The proposed slip would be located in the same footprint as the previously existing slip; dredging would be required for the 6,000-square-foot area. The proposed riverfront boardwalk would create new impact to approximately 600 square feet of riparian area. Nearby shoreline and open water areas could be impacted because of increased human activities (e.g., boat traffic, litter), although these impacts would affect habitats in localized areas. Temporary disturbances are expected to be limited in scope and duration. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities. Therefore, the boat launch ramp and docks would not be anticipated to have adverse, long-term effects on terrestrial, coastal nearshore, or marine habitats.

One of the primary alternative goals is to promote recreational fishing; therefore, an increase in fishing pressure would result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Parking capacity would limit the total number of visitors, thereby putting an upper limit on the magnitude of fishing pressure resulting from the alternative. The use of trawl gear or gillnets within the alternative is not expected. Recreational fishing could increase from current levels, although it is not expected to have substantive adverse effects on habitats because the use of the site would not change.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.17.2.2 Protected Species

Protected Aquatic Species

The alternative is composed of a freshwater stream buffered by mixed herbaceous upland and palustrine emergent wetland habitat (USFWS 2017b). The West Indian manatee and Gulf sturgeon may occur near the alternative due to the potential presence of habitat. These protected species require freshwater riverine and/or palustrine emergent wetland habitat, which provide for breeding, foraging, and general sanctuary.

The West Indian manatee and Gulf sturgeon can tolerate freshwater habitats and are known to migrate from estuarine environments into freshwater riverine systems at various times of the year (NatureServe 2016). Based on the NOAA Data Atlas (NOAA 2018) and the Gulf of Mexico Ecosystem Atlas (Love et al. 2013), it is highly unlikely that there are submerged aquatic vegetative beds large enough to attract foraging West Indian manatee and Gulf sturgeon into the area, and these rare species would only pass through the alternative very infrequently. In the unlikely event that a manatee or Gulf sturgeon is present during the construction of the alternative, impacts may include disturbance via noise from impact pile driving, and turbidity would result in short-term, minor to moderate effects. Increases in recreational fishing could increase the potential for protected species to get caught in hook and line gear or to be involved in collisions with boating traffic. However, due to the unlikely occurrence of these species within the area, adverse, long-term effects to West Indian manatee and Gulf sturgeon are not expected.

Protected aquatic species in and around the alternative may be sensitive to changes in noise sources or levels because of construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb fish and marine mammals, including manatee and common bottlenose dolphin, resulting in short-term, minor to moderate effects. Conservation measures to protect marine mammals from noise are discussed in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A). The timing of in-water, noise-producing activities would be planned to minimize disturbances to marine life. BMPs, in addition to other avoidance and mitigation measures as required by state and federal regulatory agencies, would minimize water quality impacts that could affect aquatic habitat. Although protected species are not anticipated in the alternative, these measures would minimize any adverse, minor, short-term effect to aquatic habitats that may be used by protected aquatic species. Because protected aquatic species are either not likely to occur in the alternative or because conservation measures would be implemented, no adverse impacts to protected aquatic species are anticipated.

Protected Terrestrial Species

The protected terrestrial species that may occur in near the alternative include ringed map turtle and the gopher tortoise. Most of the proposed construction work in uplands would be located on the previously developed 1-acre site; therefore, these species are unlikely to occur in the alternative.

Ringed map turtles are found abundantly in streams with moderate to fast current, numerous basking logs, and within a channel wide enough to allow the sun to reach the basking logs (NatureServe 2016). With the dominance of surrounding palustrine emergent wetlands, it is likely that the logs would be available for such behavior within the alternative.

The gopher tortoise is a non-migrant, terrestrial tortoise, favoring herbaceous or forested habitats (NatureServe 2016). The disturbed herbaceous upland habitat within the alternative contains potential burrowing habitat for this species. However, the abutting dense marsh vegetation inhibits the available amount of herbaceous ground cover required for foraging, and the saturated marsh substrate is too wet for digging burrows (Bonin 2006).

In the unlikely event that a ringed map turtle or gopher tortoise is present within the alternative, impacts may include minor disturbance via construction noise and human presence. Protected terrestrial species in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb terrestrial wildlife and shorebirds resulting on short-term, minor to moderate effects. Additionally, disturbances could result from increased human contact from fishing or boating activities. If necessary, best practices as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts to protected terrestrial species including the ringed map turtle and the gopher tortoise.

Critical Habitat

The alternative is not located within any designated critical habitat and therefore, would have no effect to critical habitat.

4.6.17.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative features would occur on a previously developed 1-acre site and, therefore, would have limited opportunity to affect terrestrial wildlife and migratory birds. Most of the 1-acre site has previously been permanently converted from undeveloped vegetated areas to a parking area and boat launch. Trees near the alternative may provide some roosting and foraging habitat for certain species, but that function is not anticipated to be adversely affected. Additionally, the bank along which the boat ramp would be constructed does not specifically provide any special breeding, roosting, or foraging habitat; therefore, no adverse effects are anticipated to terrestrial wildlife or migratory birds.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions; however, the site's proximity to waterway traffic may render these increases negligible. As previously discussed, the alternative would include BMPs described in Section 4.3.1 and the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.6.17.2.4 Marine and Estuarine Fauna

In-water work associated with the boat launch ramp would consist of placing concrete, sand, and crushed stone, as well as sheet pile in the waterway. The creation of the boat launch, docks, boardwalks, and slip ramp would permanently impact the shoreline area where these facilities are placed and would likely increase minor, long-term impacts to nearby shoreline and open water areas because of increased human activities (e.g., boat traffic, litter).

Designated EFH is present within the alternative and activities may affect aquatic fauna, fisheries, and EFH in localized areas. The overall footprint is relatively small, and temporary disturbances from construction of the alternative features are expected to be limited in scope and duration and would therefore be minor. Temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby. Therefore, the boat launch, docks, boardwalks, and slip ramp would not be anticipated to adversely affect aquatic fauna, local fisheries, or designated EFH long term.

The timing of in-water, noise-producing activities would be planned to minimize disturbances to marine life. Potential impacts to estuarine and aquatic fauna, managed fisheries, and EFH would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna, EFH, and managed species, as determined necessary by the Implementing Trustee. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.17.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.17.3 SOCIOECONOMIC ENVIRONMENT

4.6.17.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a "disproportionately high and adverse" effect on a minority or low-income population. St. Tammany Parish has fewer minority and low-income populations in the parish than compared to the State of Louisiana. Additionally, less than 22% of the population is reported as minority and less than 12% is considered low income. The alternative would reconstruct an existing boat launch and would not have a disproportionately adverse effect on the Parish. In fact, the alternative would provide a net benefit by providing improved and increased access to recreational activities, including fishing.

4.6.17.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by car and boat to the recreational resources in the vicinity. The proposed construction of boat launch, slip, parking areas, docks, and boardwalk would allow anglers, hunters, and wildlife viewers, and others to better reach the Pearl River and other waterways connecting to the Gulf of Mexico. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users.

4.6.17.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve infrastructure associated with recreational use by providing a new boat launch, improved parking areas as well as docks, slip for staging, and a boardwalk for passive recreation and wildlife viewing. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.17.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, or vibration. Impacts to portions of historic properties that damage characteristics of the site that make it eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the Middle Pearl Boat Launch. No previous cultural resources surveys and no cultural resources have been identified within the footprint of the alternative. The Highway 90 Bridge immediately adjacent to the alternative is a steel Pony Truss bridge dating to 1933 that has been evaluated by within the Louisiana Historic Bridge Inventory and has been considered eligible for listing on the NRHP (Louisiana Historic Resource Inventory [LHRI] 5202389). Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.17.3.5 Land Use and Agricultural Resources

The alternative is an existing boat launch on property owned by LDWF. Access to the water for fisheries is consistent with existing activities and would not adversely affect current land use. No agricultural resources are associated with the property.

4.6.17.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve the improvement of the existing boat launch facility, including the construction of floating mooring piers, upgraded parking lot, and a boardwalk. Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. Impacts from construction may be adverse, but localized, minor, and short term. Long-term impacts would be beneficial because improvements would enhance the aesthetics of the existing boat launch facility. Views of the site and the surrounding areas would not noticeably change from the implementation of the alternative.

4.6.17.5 PUBLIC HEALTH AND SAFETY

4.6.17.5.1 Noise

Noise associated with equipment during construction of the boardwalk (including placement of new piles), boat launch, boat slip, parking area, access road, and floating docks would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, preparing the site, installing piles, placing foundations, grading, and placing fill. Implementation of the alternative would include transportation of construction materials to the site, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

No human communities are in close proximity to the alternative. The nearest residence is over 1.5 miles away. Persons recreating on the shorelines adjacent to construction activities could be affected by noise during construction of the proposed facilities. Construction activities at the site would result in short-term, minor, adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts at the alternative from personal vehicle use, boating, fishing, and other recreational activities would likely be minor and adverse.

4.6.17.5.2 Resiliency

The alternative includes construction of a boat ramp, floating docks, wooden boardwalk, and boat slip for staging. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design. To minimize adverse, long-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.18 Improvements to Grand Avoille Boat Launch

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.18.1 PHYSICAL ENVIRONMENT

4.6.18.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include construction of the parking lot, access roadway, boat ramp, and wooden docks. Operation and maintenance of these facilities may also affect soils and substrates. Soils at the alternative include Aquents, dredged and Udorthents, 1 to 20 percent slopes, neither of which is classified as highly erodible.

In-water work is expected because of the construction of the boat launch and docks. The over-water area of the docks is estimated to total approximately 384 square feet. Wooden dock construction would include placement of new treated wooden piles using a pile driver. Minor, long-term substrate displacement and compaction from piling installation would result. The number, size, and depth of piles for the wooden dock would be subject to final design, although it is expected that less than 12 square feet total of substrate would be displaced in the marine environment, assuming 1 square foot of disturbance per pile. In-water work associated with the boat launch is estimated to be 500 square feet. The in-water work would primarily consist of the placement of concrete, sand, and crushed stone. Sidewalls, typically constructed of vinyl sheet pile, would be placed along the boat launch using heavy equipment to drive it below the surface vertically along the sides of the ramp to prevent erosion and to provide long-term stability. Total in-water work area is estimated to be 884 square feet.

Excavation would occur along the riparian area for the boat launch and docks, and in the terrestrial environment for the parking lots for cars, trucks, and trailers and access roads. The depth of ground disturbance and excavation would depend on final design for the boat launch, docks, restroom, and pavilion. For the parking areas and roadways, depth is expected to be less than 6 inches.

Construction equipment for staging would likely include bulldozers and graders, pile driving machinery, barge(s), a bobcat, and dump trucks. Staging is anticipated to occur within the alternative in areas proposed for facilities that would be graded. Construction of the parking area, boat launch, and docks would impact soils and substrates within the footprint of each alternative feature. The access road has been sited to follow existing access, and to direct foot and vehicle traffic into designated areas, minimizing adverse impacts to the overall site.

Short-term, minor disturbances to terrestrial soils and substrates would occur on-site from construction and site preparation activities. However, the impacts would be localized to several small areas across the alternative. Permanent conversion of soils and substrates would occur in the small footprint of alternative features. However, because the site is currently developed as an existing boat launch, the newly converted areas would be small and minor effects are expected. Excavated soils would be stockpiled on-site in order to reclaim and revegetate disturbed areas that are not needed for alternative features.

4.6.18.1.2 Hydrology and Water Quality

The alternative includes in-water work for construction of the boat launch and docks. Additionally, ground disturbance as a result of excavation and grading during construction could result in sedimentation entering the surrounding waterway. However, these effects would be localized, minor, and short term and would conclude once construction is completed. The introduction of impervious surfaces for parking areas and roadways may increase sedimentation and stormwater runoff into the receiving water body. These effects to water quality and hydrology would be long term, but minor due to the small size of the alternative and the use of an existing boat launch footprint. Users of the boat launch have potential to increase the release of fuel and other effluents into the receiving water body. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.18.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, cranes, small barges with crane, small excavators, fork lifts, roller, generators, small trucks, pile drivers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts might include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use that may result from a slightly larger parking area for cars and trailers, the potential increase in emissions would be nominal.

4.6.18.2 BIOLOGICAL ENVIRONMENT

4.6.18.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative features under consideration include upland-based items such as an access road and parking area. Some in-water work is also proposed for construction of the boat launch and docks. The 0.54-acre site is currently developed for use as a boat launch and parking. The alternative would take place in upland, wetland, or aquatic habitats. The primary impacts to the environment would be through the short-term effects of construction, including potential erosion and sedimentation.

In-water work associated with the boat launch would consist of placing concrete, sand, and crushed stone, as well as vinyl sheet pile in the waterway. No riparian vegetation is anticipated to be removed from the shoreline to create the boat ramp because the alternative involves the replacement of an existing boat ramp. The wooden docks and fishing pier would require the driving of 12 piles into the substrate.

The creation of the boat launch would not create new permanent, minor impact to the shoreline area where the ramp and docks would be placed; however, nearby shoreline and open water areas could be impacted because of increased human activities (e.g., boat traffic, litter). These impacts would affect habitats in localized areas, the footprint of the ramp and docks are small (0.02 acre). Temporary disturbances are expected to be limited in scope and duration and would therefore be minor. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities. Therefore, the boat launch ramp and docks would not be anticipated to have adverse, long-term effects on terrestrial, coastal nearshore, or marine habitats.

One of the primary alternative goals is to promote recreational fishing; therefore, an increase in fishing pressure would result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Parking capacity would limit the total number of visitors, thereby putting an upper limit on the magnitude of fishing pressure resulting from the alternative. The use of trawl gear or gillnets within the alternative is not expected. Recreational fishing could increase from current levels, though it is not expected to have substantive adverse effects on habitats as the use of the site would not change.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.18.2.2 Protected Species

Protected Aquatic Species

Based on consultation with USFWS, no protected aquatic species have been identified in the alternative's footprint; therefore, no adverse impacts to protected aquatic species are anticipated.

Protected Terrestrial Species

Although piping plover and red knot are found in St. Mary Parish, suitable habitat for these species is not present in the alternative. Most of the proposed construction work in uplands would be located on a previously developed 0.54-acre parcel. Adverse impacts to protected terrestrial species is not anticipated from the alternative.

Critical Habitat

No critical habitat for any protected species is located within the alternative; therefore, the alternative would not be expected to have adverse effects to designated critical habitat.

4.6.18.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative would occur on a previously developed 0.54-acre site and, therefore, would have limited opportunity to affect terrestrial wildlife and migratory birds. Most of the 0.54-acre site has previously been permanently converted from undeveloped vegetated areas to a parking area and boat launch. The land-based construction effort would require minimal tree clearing due to the low tree density within the alternative. These trees may provide some roosting and foraging habitat for certain species, but that function is not anticipated to be adversely affected. Additionally, the bank along which the boat ramp would be constructed does not specifically provide any special breeding, roosting, or foraging habitat for species; therefore, no adverse effects are anticipated due to the alternative.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds, resulting in short-term, minor to moderate effects. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions; however, the site's proximity to waterway traffic may render these increases negligible. As previously discussed, the alternative would include BMPs described in Section 4.3.1 and the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.6.18.2.4 Marine and Estuarine Fauna

In-water work associated with the boat launch ramp would consist of placing concrete, sand, and crushed stone, as well as vinyl sheet pile in the waterway. The ramp would replace an existing ramp; therefore, no vegetation would need to be removed from the shoreline. The wooden docks would require the driving of 12 piles into the substrate. The creation of the boat launch and docks would permanently impact the shoreline area where these facilities are placed and would likely increase impacts to nearby shoreline and open water areas because of increased human activities (e.g., boat traffic, litter).

Designated EFH is present within the alternative and construction activities may affect aquatic fauna, fisheries, and EFH in localized areas, the overall footprint is relatively small, and temporary disturbances are expected to be limited in scope and duration and would therefore be minor. Temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby.

The timing of in-water, noise-producing activities would be planned to minimize disturbances to marine life. Potential impacts to estuarine and aquatic fauna, managed fisheries, and EFH would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna, EFH, and managed species, as determined necessary by the Implementing Trustee. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.18.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.18.3 SOCIOECONOMIC ENVIRONMENT

4.6.18.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a "disproportionately high and adverse" effect on a minority or low-income population. St. Mary Parish has a distribution of minority and low-income populations that is similar to the State of Louisiana. Approximately, 44% of the Parish population is reported as minority and 22% is considered low income. The alternative would reconstruct an existing boat launch and would not have a disproportionately adverse effect on the Parish. In fact, the alternative would provide a net benefit by providing improved and increased access to recreational activities, including fishing.

4.6.18.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access to the recreational resources near the alternative. The proposed construction of a boat launch and docks would allow anglers, wildlife viewers, and others to better reach the Charenton Drainage and Navigation Canal and other waterways connecting to the Gulf of Mexico. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.18.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve infrastructure associated with recreational use by providing a new boat launch and improved parking area, along with docks for passive recreation and wildlife viewing. Although the alternative would likely increase recreational use in the area, traffic on nearby roads would not be anticipated to increase substantially over existing conditions.

4.6.18.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics of the site that make it eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the alternative. One previous cultural resource survey associated with improvements to the Atchafalaya River Basin Floodway Levees was conducted in 1979 (22-0619). No cultural resources have been identified at the immediate location of the alternative. According to USGS topographic maps, the West Atchafalaya River Basin Floodway Levee and adjacent canal were constructed between 1933 and 1954, suggesting that there may be a potential for very recent historic resources at or along the levee. However, as the levee has been rebuilt and maintained since that time, there is little potential for intact cultural resources within the footprint of the levee. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.18.3.5 Land Use and Agricultural Resources

The alternative is an existing boat launch on property owned by St. Mary Parish. Access to the water for fisheries is consistent with existing activities and would not adversely affect current land use.

4.6.18.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve the improvement of the existing boat launch facility, including the construction of mooring piers and upgraded parking lot. Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. Impacts from construction may be adverse, but localized, minor, and short term. Long-term impacts would be beneficial, as improvements would enhance the aesthetics of the existing boat launch facility. Views of the site and the surrounding areas would not noticeably change from the implementation of the alternative.

4.6.18.5 PUBLIC HEALTH AND SAFETY

4.6.18.5.1 Noise

Noise associated with equipment during construction of the alternative would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, preparing the site, installing piles, grading, and placing aggregate. Implementation of the alternative would include transportation of construction materials to the site, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

No human communities are in close proximity to the alternative. The nearest residence is over 2 miles away. Persons recreating on the shorelines adjacent to construction activities could be affected by noise during construction of the proposed facilities. Construction activities at the site would result in short-term, minor, adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts at the alternative from personal vehicle use, boating, fishing, and other recreational activities would likely be minor and adverse.

4.6.18.5.2 Resiliency

The alternative includes construction of a boat ramp and wooden docks. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design. To minimize adverse, long-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.19 Belle Chasse

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A). A MAM plan has been prepared for the alternative and is located in Appendix C.

4.6.19.1 PHYSICAL ENVIRONMENT

4.6.19.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include construction of the parking lot and boat ramp. Operation and maintenance of these facilities may also affect soils and substrates. Soils at the alternative are primarily Rita mucky clay, which is classified as very poorly drained and slightly erodible.

In-water work associated with installation of the boat ramp is estimated to be 1,500 square feet. The in-water work would primarily consist of the placement of the pre-cast concrete ramp. Sidewalls, typically constructed of vinyl sheet pile, would typically be placed along the boat launch using heavy equipment to drive it below the surface vertically along the sides of the ramp to prevent erosion and to provide long-term stability. No over-water activities are proposed.

Excavation would occur along the riparian area for the boat launch, and in the terrestrial environment for the parking lots for cars, trucks, and trailers. The depth of ground disturbance and excavation would depend on final design for the boat launch. For the parking area, depth is expected to be 6 to 8 inches.

Construction equipment for staging would likely include bulldozers and graders, pile driving machinery, barge(s), a bobcat, and dump trucks. Staging is anticipated to occur within the alternative in areas proposed for facilities that would be graded. Construction of the parking area and boat launch would impact soils and substrates within the footprint of each alternative feature. The access road to the site is existing and not anticipated to be impacted.

Short-term disturbances to terrestrial soils would occur on-site from construction and site preparation activities; however, the impacts would be localized to an existing parking area. Substrates within the boat launch area that extend beyond the existent footprint would be permanently converted to hard surface resulting in minor, long-term effects. The site is currently developed as an existing boat launch; therefore, it is anticipated that areas not necessary for buildout of the alternative would not likely be disturbed during construction. Excavated soils would be stockpiled on-site in order to reclaim and revegetate disturbed areas that are not needed for alternative features.

4.6.19.1.2 Hydrology and Water Quality

The alternative includes in-water work for construction of the boat launch. Additionally, ground disturbance as a result of excavation and grading during construction could result in sedimentation entering the surrounding waterway. The adverse effects would be localized, minor, and short term and would conclude once construction is completed. The use of existing impervious surfaces for parking areas and roadways would not likely increase sedimentation and stormwater runoff into the receiving water body over the existing condition. Users of the boat launch have potential to increase the release of fuel and other effluents into the receiving water body. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.19.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, cranes, small barges with crane, small excavators, fork lifts, roller, generators, small trucks, pile drivers, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use that may result from a larger parking area for cars and trailers, the potential increase in emissions would be nominal.

4.6.19.2 BIOLOGICAL ENVIRONMENT

4.6.19.2.1 Terrestrial, Coastal-Nearshore, and Marine Habitats

The alternative features under consideration include upland-based parking area. Some in-water work is also proposed for construction of the boat launch. The alternative is currently developed as an existing boat launch. The alternative would take place in upland, wetland, or riverine habitats. The primary impacts to the environment would be through the short-term effects of construction, including potential erosion and sedimentation.

In-water work associated with the boat launch would consist of placing pre-cast concrete and potentially vinyl sheet pile in the waterway. No riparian vegetation is anticipated to be removed from the shoreline to install the boat ramp because the alternative involves the replacement of an existing boat ramp.

The installation of the boat launch would permanently impact the shoreline area where the ramp is placed, and would potentially impact nearby shoreline and open water areas because of increased human activities (e.g., boat traffic, litter), resulting in minor, long-term effects. Although these impacts would affect habitats in localized areas, the footprint of the ramp is relatively small (0.03 acre), and temporary disturbances are expected to be limited in scope and duration. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities. Therefore, the boat launch would not be anticipated to have adverse, long-term effects on terrestrial, coastal nearshore, or marine habitats.

One of the primary alternative goals is to promote recreational fishing; therefore, an increase in fishing pressure would result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Parking capacity would limit the total number of visitors, thereby putting an upper limit on the magnitude of fishing pressure resulting from the alternative. The use of trawl gear or gillnets within the alternative is not expected. Although recreational fishing would increase from current levels, it is not expected to have substantive adverse, long-term effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.19.2.2 Protected Species

Protected Aquatic Species

The alternative features would have a small footprint of in-water work in the canal. The alternative location consists of a freshwater stream buffered by mixed forested and herbaceous upland habitat (USFWS 2017b); therefore, there is some potential for the West Indian manatee to be present within the alternative. The manatees can tolerate freshwater habitats and are known to migrate from estuarine environments into freshwater riverine systems at various times of the year (NatureServe 2016). Sightings of manatees in Louisiana riverine habitats are rare and likely occur in areas where submerged or emergent aquatic vegetation is available for forage (LDWF 2018). The alternative area lacks submerged or aquatic vegetation; therefore, it is unlikely a manatee would be present during construction of the alternative. In the unlikely event that a manatee is present during the alternative construction activities, short-term impacts may include disturbance via noise from impact pile driving.

Protected aquatic species in and around the alternative may be sensitive to changes in noise sources or levels because of construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb fish and marine mammals resulting in short-term, minor to moderate effects. Conservation measures to protect marine mammals from noise are discussed in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A). The timing of in-water, noise-producing activities would be planned to minimize disturbances to marine life. BMPs, in addition to other avoidance and mitigation measures as required by state and federal regulatory agencies, would minimize water quality impacts that could affect aquatic habitat.

Although protected species are not anticipated in the alternative area, the BMPs would minimize any minor, adverse, short-term effect to aquatic habitats that may be used by protected aquatic species. Because protected aquatic species are either not likely to occur in the area or because conservation measures would be implemented, no adverse, long-term impacts to protected aquatic species are anticipated.

Protected Terrestrial Species

The protected terrestrial species that may occur in Plaquemines Parish include the piping plover and red knot. Most of the proposed construction work in uplands would be located on the previously developed 0.11-acre site. Adverse impacts to protected terrestrial species is not anticipated from the alternative.

Critical Habitat

No critical habitat for any protected species is located within the alternative; therefore, the alternative would not be expected to have adverse effects to designated critical habitat.

4.6.19.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative features would occur on a previously developed 0.11-acre site and, therefore, would have limited opportunity to affect terrestrial wildlife and migratory birds. Most of the 0.11-acre site has previously been permanently converted from undeveloped vegetated areas to a parking area and boat launch. The land-based construction effort would not require tree clearing due to the lack of trees within the alternative. Trees near the alternative may provide some roosting and foraging habitat for certain species, but that function is not anticipated to be adversely affected. Additionally, the bank along which the boat ramp would be constructed does not specifically provide any special breeding, roosting, or foraging habitat for any of the listed species; therefore, no adverse effects to terrestrial wildlife and migratory birds are anticipated from the alternative.

4.6.19.2.4 Marine and Estuarine Fauna

In-water work associated with the boat launch ramp would consist of placing pre-cast concrete and potentially vinyl sheet pile in the waterway. The ramp would replace an existing ramp; therefore, no vegetation would need to be removed from the shoreline. The installation of the boat launch would permanently impact the shoreline area where the ramp is placed and may increase impacts to nearby shoreline and open water areas because of increased human activities (e.g., boat traffic, litter).

No EFH has been identified at the alternative and no effects to EFH would occur. Construction activities may affect aquatic fauna and fisheries in localized areas, the overall footprint is relatively small, and temporary disturbances are expected to be limited in scope and duration and would therefore be minor. Temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby.

The timing of in-water, noise-producing activities would be planned to minimize disturbances to marine life. Potential impacts to estuarine and aquatic fauna and managed fisheries would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna and managed species, as determined necessary by the Implementing Trustee. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.19.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.19.3 SOCIOECONOMIC ENVIRONMENT

4.6.19.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a “disproportionately high and adverse” effect on a minority or low-income population. St. Tammany Parish has fewer minority and low-income populations than in the State of Louisiana. Additionally, less than 35% of the population is reported as minority and less than 18% is considered low income. The alternative would reconstruct an existing boat launch and would not have a disproportionately adverse effect on the Parish. In fact, the alternative would provide a net benefit by providing improved and increased access to recreational activities, including fishing.

4.6.19.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by car and boat to the recreational resources near the site. The proposed construction of boat launch, slip, parking areas, docks, and boardwalk would allow anglers, wildlife viewers, and others to better reach Barataria Bay and other waterways connecting to the Grand Isles and the Gulf of Mexico. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.19.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve infrastructure associated with recreational use, including passive recreation and wildlife viewing, by providing a safer boat launch and improved parking for access to the water. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.19.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics of the site that make it eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the alternative. One previous cultural resources survey associated with improvements to the West Bank and Vicinity Hurricane Protection Levee was conducted in 2010 (22-3560). No cultural resources have been identified at the immediate location of the alternative. According to USGS topographic maps, the adjacent Hero Canal was constructed prior to 1932, suggesting that there may be a potential for very recent historic resources at or along the levee or within the body of the canal, itself. However, as the levee has been rebuilt and maintained since that time, there is little potential for intact cultural resources within the footprint of the levee. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.19.3.5 Land Use and Agricultural Resources

The alternative is an existing boat launch on property owned by Plaquemines Parish. Access to the water for fisheries is consistent with existing activities and would not adversely affect current land use. Additionally, this use does not interfere with operations conducted by the nearby Naval Air Station Joint Reserve Base. No agricultural resources are associated with the property.

4.6.19.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve the improvement of the existing boat launch facility, including the construction of an upgraded parking lot. Construction activities may impede the natural aesthetics and visual resources of the area; however, such impacts would be short term. Impacts from construction may be adverse, but localized, minor, and short term. Long-term impacts would be beneficial, as improvements would enhance the aesthetics of the existing boat launch facility. Views of the site and the surrounding areas would not noticeably change from the implementation of the alternative.

4.6.19.5 PUBLIC HEALTH AND SAFETY

4.6.19.5.1 Noise

Noise associated with equipment during construction of the boat launch and parking area would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, preparing the site, grading, and placing fill. Implementation of the alternative would include transportation of construction materials to the site, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

No human communities are in close proximity to the alternative. The nearest residence is over 1 mile away. Persons recreating on the shorelines adjacent to construction activities could be affected by noise during construction of the proposed facilities. Construction activities at the site would result in short-term, minor, adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts at the alternative from personal vehicle use, boating, fishing, and other recreational activities would be likely.

4.6.19.5.2 Resiliency

The alternative includes construction of a boat ramp with associated parking. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design. To minimize adverse, long-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.20 Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.20.1 PHYSICAL ENVIRONMENT

4.6.20.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include development of the parking lots at the end of each pier. Operation and maintenance of the parking lots may also affect soils. Soils near proposed parking lots are Felicity loamy fine sand. This soil is occasionally flooded, somewhat poorly drained, and slightly erodible. Little in-water work is expected because proposed parking lots are anticipated to be in upland areas. All other enhancements would be on the existing piers, not involve any substrate disturbance, and are not discussed further.

Excavation would occur along the shoreline terrestrial environment for the parking lots for cars, trucks, and trailers. The depth of ground disturbance and excavation is expected to be approximately 6 to 14 inches to accommodate the concrete parking lots. Construction of the parking areas would impact soils and substrates within relevant footprints.

Minor, short-term impacts to soils may occur on-site from construction and site preparation activities for the parking lots. However, the impacts would be localized to two small areas at the end of each pier. Any excavated soils would be minimal and would be stockpiled on-site in order to reclaim and revegetate disturbed areas that are not needed for development of proposed parking.

4.6.20.1.2 Hydrology and Water Quality

Although the alternative does not include in-water work for construction of the parking lots, ground disturbance as a result of excavation and grading during construction could result in sedimentation entering the surrounding waterway. Likewise, development of pier improvements would not require

in-water work, though potential material during facility construction could enter the waters of Caminada Pass. The alternative would implement hydrology and water quality BMPs described in Section 4.3.1 to avoid and minimize potential effects to receiving water bodies. However, these effects would be localized, minor, and short term and would conclude once construction is completed. The introduction of impervious concrete parking areas may increase sedimentation and stormwater runoff into the receiving water body. These effects to water quality and hydrology would be long term, but minor due to the small size of the alternative. No long-term effects from use of the on-pier facilities would be anticipated. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for in-water work and construction would be obtained as necessary, including Section 404 CWA, Section 401 Water Quality Certification, and Section 402 NPDES permits. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.20.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as trucks, backhoes, tractor trailers, cranes, small excavators, fork lifts, roller, generators, small trucks, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of construction, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a slight increase in emissions from the increase in recreational use of the piers; however, even with the potential increase in use that may result from a larger parking area for cars and trailers, the potential increase in emissions would be nominal.

4.6.20.2 BIOLOGICAL ENVIRONMENT

4.6.20.2.1 Terrestrial, Coastal-Nearshore, and Marine Habitats

The alternative features under consideration include upland-based parking areas and on-pier shelters and bathrooms/fish cleaning stations. No in-water, aquatic work is anticipated for construction of any proposed improvement to the piers. The proposed improvement area is currently developed, and would continue to be used for recreational use as a fishing pier by the Town of Grand Isle. Proposed parking would take place in a mix of disturbed and undisturbed natural upland habitats along Caminada Pass. The primary impacts to the environment would be through the short-term, minor effects of construction of the parking lots, including potential erosion and sedimentation.

All improvements would be located within areas owned and operated by the Town of Grand Isle to facilitate free public use of the Caminada Pass piers. The alternative would be unlikely to cause disturbances to surrounding natural areas. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities. The alternative is not be anticipated to have adverse, long-term effects on terrestrial, coastal nearshore, or marine habitats.

One of the primary goals of the alternative is to promote and enhance recreational use of the piers; therefore, an increase in public use may result in an increase in the use. Proposed enhancements consider the existing and anticipated capacity of the piers. Although recreational use may increase from current levels, it is not expected to have substantive adverse effects habitat near Caminada Pass.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. The Town of Grand Isle currently implements trash management that includes a centralized dumpster repository as well as routine trash collection efforts. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.20.2.2 Protected Species

Protected Aquatic Species

Although the alternative would avoid in-water work for construction associated with the fishing pier improvements and parking lots, the alternative would be immediately adjacent to aquatic habitat that has the potential for protected species. Protected aquatic species with potential to occur in this area include Gulf sturgeon, pallid sturgeon, West Indian manatee, and five species of sea turtles. Though some suitable estuarine habitat may be present within the general area, the likelihood that these species would enter the area during construction of the alternative is low.

Protected aquatic species in and around the alternative may be sensitive to changes in noise sources or levels because of construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb fish and marine mammals resulting minor to moderate, short-term impacts. Conservation measures to protect marine mammals from noise are discussed in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A). The timing of near-water noise-producing activities would be planned to minimize disturbances to marine life. BMPs, in addition to other avoidance and mitigation measures as required by state and federal regulatory agencies, would minimize water quality impacts that could affect aquatic habitat. These measures would minimize any adverse, minor, short-term effect to aquatic habitats that may be used by protected aquatic species. Because conservation measures would be implemented, no adverse, long-term impacts to protected aquatic species are anticipated.

Protected Terrestrial Species

Piping plover and red knot both require estuarine and marine shores found near the alternative, outside the urban development of Grand Isle. The alternative does not occur in suitable habitat for these species as the alternative location is already developed and located in an urban environment. Individuals may fly through the alternative during construction, although this is unlikely. Best practices and conservation measures, as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A), would be followed during construction to avoid impacts to protected terrestrial species such as the red knot and piping plover. Additionally, all individuals working on the alternative construction would be provided with information in support of general awareness of piping plover and red knot presence and the means to avoid birds and their critical or otherwise important habitats. With the implementation of the best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A), no adverse, long-term effects to the piping plover and red knot are anticipated.

Critical Habitat

Critical habitat for the piping plover is located around the marine shoreline habitat along Elmer's Island and Grand Isle. However, the Caminada Pass area is located outside of this designated critical habitat and no adverse effects would occur.

4.6.20.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative features would predominantly occur within or adjacent to an existing public pier that has been previously developed and managed for human and natural environment land uses. Several migratory bird species have the potential to occur within the area. During construction, shorebirds would likely move to undisturbed habitat located adjacent to these areas. Once short-term impacts from construction are completed, these shorebirds would once again use suitable habitat surrounding the proposed improvements. Best practices as described in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) would be implemented to avoid and minimize potential impacts to terrestrial wildlife and migratory birds. Therefore, adverse effects to these species would not be anticipated.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, pile installation equipment) is known to disturb migratory and shorebirds. These noises could be slightly more disturbing to any resting or roosting birds that may use the site compared to baseline conditions. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.6.20.2.4 Marine and Estuarine Fauna

Caminada Pass is a water passage between Caminada Bay and the Gulf of Mexico surrounded by Elmer's Island, Grand Isle, and the mainland of Louisiana. The environment surrounding the Caminada Pass area is transitional mix of estuarine and marine habitats, increasing toward the latter habitat from northwest to southeast. Although designated EFH is present within the Caminada Pass area, no impacts to coastal-nearshore habitats would be anticipated because the alternative does not include in-water work. Over-water construction activities on the existing piers may affect aquatic fauna and EFH in localized areas immediately surrounding the piers, but these activities would be limited in scope and duration. Temporarily disturbed aquatic fauna would likely find refuge in plentiful suitable habitats nearby. The timing of any noise-producing activities would be planned to minimize disturbances to coastal-nearshore and marine life. Potential impacts to estuarine and aquatic fauna and managed fisheries would be considered and avoided or minimized to the extent practicable during design and construction.

When impacts cannot be avoided, BMPs and conservation measures would minimize the magnitude and duration of impacts to aquatic fauna, EFH, and managed species, as determined necessary by the Implementing Trustee. Trash management would be provided to minimize littering. Unavoidable impacts to jurisdictional wetlands and waters are believed to be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit.

4.6.20.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.20.3 SOCIOECONOMIC ENVIRONMENT

4.6.20.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a “disproportionately high and adverse” effect on a minority or low-income population. Although the Jefferson Parish is a minority population that is disproportionately more low-income than elsewhere in the state, the alternative would not have a disproportionately adverse effect to these communities and, in fact, would provide a net benefit to nearby communities by providing improved and increased access to recreational activities, including fishing.

4.6.20.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by foot, public education, and recreational use experience of the Caminada Pass piers and Town of Grand Isle area. The proposed parking lots, shelters, and bathrooms/fish cleaning stations would provide recreational users with exceptional facilities and enhanced user experience. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users.

4.6.20.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve the Town of Grand Isle’s operation and management of the existing infrastructure associated with the pier and its recreational use. Although the alternative would likely increase recreational use of the pier and Town of Grand Isle area, traffic on nearby roads would not be anticipated to increase substantially over existing conditions.

4.6.20.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics of the site that make it eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior’s Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the alternative. No previous cultural resources surveys and no cultural resources have been identified at the immediate location of the alternative. Seven shipwrecks or obstruction points have been recorded within a 0.5-mile radius of the waters adjacent to the alternative. The pier was constructed in the 1950s and, therefore, it too may qualify as a historic resource. Consultation with the Louisiana SHPO and tribes to determine any additional requirements would occur prior to any ground-disturbing activities under the alternative.

4.6.20.3.5 Land Use and Agricultural Resources

The alternative is consistent with existing land use as managed by the Town of Grand Isle for the Caminada Pass piers. No adverse effect to current management or land use would occur.

Agricultural lands are not present within the immediate area; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.20.4 AESTHETICS AND VISUAL RESOURCES

The alternative would involve the construction of new recreation facilities on two existing fishing piers. During construction, impacts on visual resources from the alternative would be adverse, minor, and short term, primarily because of the presence of construction personnel, equipment (e.g., fences, stockpiles), vehicles, and unfinished structures visible to the public.

After construction, the new recreational facilities would be seen from adjacent public roads and recreational waterways. Given the developed nature of the area, the alternative would not change the site's aesthetics and visual resources over the long term.

4.6.20.5 PUBLIC HEALTH AND SAFETY

4.6.20.5.1 Noise

Noise associated with equipment construction would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, preparing the site, grading, and fill placement. Implementation of the alternative would include transportation of construction materials to the existing piers, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

The Town of Grand Isle may be affected by noise during construction of the alternative. Construction noise may be a nuisance to the public recreating adjacent to construction activities. Construction activities at the site would result in short-term, minor, adverse impacts to noise within the pier area and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts.

Once the improvements are constructed, visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts from recreational use activities would likely be adverse but minor.

4.6.20.5.2 Resiliency

The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be further determined during final design. To minimize adverse, long-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety in and around the piers.

4.6.21 Palmetto Island State Park Improvements

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. The Final PDARP/PEIS and Section 4.3.1 of this RP/EA contain extensive best practices that could be followed at the discretion of the Implementing Trustee, as applicable to species and their habitats, as well as many general construction measures the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.21.1 PHYSICAL ENVIRONMENT

4.6.21.1.1 Geology and Substrates

Aspects of the alternative that may affect geology, soils, and substrates include the construction of an event pavilion. Operation and maintenance of these facilities may also affect soils and substrates. Soils at the alternative include: Barbary much, 0 to 1 percent slopes, frequently flooded; Coteau-Patoutville-Frost silt loams, gently undulating; Fausse clay, 0 to 1 percent slopes, frequently flooded; and Patoutville silt loam, 0 to 1 percent slopes. None of these soils are highly erodible.

Excavation would occur for the construction of the group camp area, five new cabins, and two new pavilions entirely in terrestrial environments, which would include extensions of existing underground park utilities. The depth of ground disturbance and excavation would depend on final design for these structures, but is expected to be similar to that of existing infrastructure within the park.

Construction equipment for staging would likely include bulldozers and graders, a bobcat, and dump trucks. Staging is anticipated to occur within the Palmetto Island State Park on existing parking areas. Construction of the proposed new facilities would impact soils within the footprint of the alternative features, which mostly would be co-located with existing park infrastructure. Existing roadways and footpaths would be used to direct foot and vehicle traffic into designated areas, minimizing adverse impacts to the overall site during and after construction.

Short-term, minor disturbances to soils would occur on-site from construction and site preparation activities. However, the impacts would be localized to several small areas across the alternative and are mostly co-located with existing park infrastructure. Minor, long-term impacts to soils would result from the construction of the new group camp facilities, additional cabins, and asphalt overlay for access roads and parking areas to the group camp and cabins. Excavated soils would be stockpiled on-site in order to reclaim and revegetate disturbed areas that are not needed for alternative features.

4.6.21.1.2 Hydrology and Water Quality

Ground disturbance as a result of the construction of the group camp area, new cabins, and new pavilions and enhancement of the existing trail system would include excavation, filling, and minor grading during site preparation and could result in sedimentation downhill. However, no water bodies are nearby the alternative elements, therefore any sediments that escape the alternative would not be likely to enter any waterways and impacts would not be anticipated. The alternative would implement hydrology and water quality BMPs described in Section 4.3.1 to avoid and minimize potential effects to surrounding areas. These effects would be short term and localized and would conclude once construction is completed. The introduction of new impervious surfaces may increase sedimentation and stormwater runoff into the surrounding areas, but would be unlikely to affect nearby waterways. The alternative does not include any in-water work. Evaluation of potential impacts to stormwater and pollutant loads would be further evaluated during E&D.

Prior to construction, federal and state permits for construction would be obtained as necessary. Pollution prevention plans would be prepared, as necessary, in conjunction with the NPDES permitting process prior to construction. These plans would include any specifications and BMPs necessary for control of erosion and sedimentation from construction-related activities.

4.6.21.1.3 Air Quality and Greenhouse Gas Emissions

Implementation of the alternative could include use of construction equipment such as bulldozers, trucks, backhoes, tractor trailers, cranes, small excavators, fork lifts, roller, generators, small trucks, and hand tools. During construction activities, impacts to air quality would occur from exhaust of gasoline- and diesel-powered construction vehicles and equipment. Most impacts to air quality would be expected to be localized and occur only during active construction activities.

Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria pollutants, GHGs, and other air pollutants. However, because of the small scale and short duration of the construction portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. Long-term, ongoing impacts include a slight increase in emissions from the increase in recreational use of the site; however, even with the potential increase in use that may result, the potential increase in emissions would be nominal.

4.6.21.2 BIOLOGICAL ENVIRONMENT

4.6.21.2.1 Terrestrial, Coastal Nearshore, and Marine Habitats

The alternative features under consideration include upland-based items such as construction of a group camp, new cabins, and new pavilions and enhancements to the existing trail system. No in-water work is associated with the alternative. The 1,299-acre site is currently managed as a state park that includes numerous recreational structures and associated infrastructure, as well as natural areas, including upland, wetland, and aquatic habitats. The primary impacts to the environment would be through the short-term effects of construction, including potential erosion and sedimentation.

The construction of a group camp, new cabins, and new pavilions and enhancements to the existing trail system would be located within the Palmetto Island State Park. The alternative elements would be co-located with existing park infrastructure and vegetation clearing that could affect the surrounding undisturbed natural areas would be minimized to the extent practicable resulting short-term, minor and negligible to minor long-term impacts to habitats. The Trustees would carefully manage implementation and rely upon the MAM plan to ensure impacts are minimized. Some mobile species may be able to move out of the disturbed area, and wildlife would likely use plentiful suitable habitats nearby during construction activities. Therefore, the alternative would not be anticipated to have adverse, long-term effects on terrestrial habitats.

One of the primary goals of the alternative is to improve recreational fishing experiences; therefore, an increase in fishing pressure would likely result in an increase in the use and potential loss of hook and line gear and potentially small, personal crab pots. Parking capacity would limit the total number of visitors, thereby putting an upper limit on the magnitude of fishing pressure from the park's boat launch resulting from the alternative's park infrastructure improvements. The use of trawl gear or gillnets within the alternative is not expected. Although recreational fishing would increase from current levels, it is not expected to have adverse, long-term effects on habitats.

Potential impacts to habitats would be avoided or minimized to the extent practicable during design and construction, as determined necessary by the Implementing Trustee. This includes locating proposed elements outside of sensitive habitats whenever possible. The state park currently implements trash

management that includes a centralized dumpster repository as well as routine trash collection efforts. Unavoidable impacts to jurisdictional wetlands and waters would be self-mitigating, consistent with any such requirements contained in the Section 404 CWA permit; however, none are anticipated to be needed for the alternative elements.

4.6.21.2.2 Protected Species

Protected Aquatic Species

The alternative would not include any in-water work and would be limited to uplands. Therefore, no impacts to protected aquatic species is anticipated from the alternative.

Protected Terrestrial Species

All of the proposed construction associated with the alternative would occur in uplands within the existing 1,299-acre Palmetto Island State Park. The alternative would not occur in habitat that is optimal for the piping plover and red knot, although these species may occur in Vermilion Parish. Due to lack of suitable habitats in the alternative, the piping plover and red knot are unlikely to be present; therefore, adverse impacts to these species would not be anticipated.

Critical Habitat

Designated critical habitat it is present in alternative. No effect to critical habitat would result from the alternative.

4.6.21.2.3 Terrestrial Wildlife, including Migratory Birds

The alternative features would occur within the existing state park that has been previously developed and managed for human and natural environment land uses. Several migratory bird species have the potential to occur within the alternative. Potential effects from construction of these features may include some removal of foraging, nesting, or other habitat, if unavoidable, and disturbance from noise during construction.

Wildlife in and around the alternative may be sensitive to changes in noise sources or levels due to construction. Noise from construction equipment (e.g., generators, bulldozers) is known to disturb migratory birds. These effects during construction would be minor and short term. Although a slight increase in recreational use of the park could result in a slight increase in long-term noise levels, these noise levels would be very similar to the baseline conditions and would be considered negligible. As previously discussed, the alternative would include BMPs described in the Final PDARP/PEIS best practices (DWH Trustees 2016:Section 6, Appendix A) necessary to reduce potential effects from construction-related activities, and coordination with LDWF as part of E&D to avoid and minimize effects to species would be conducted prior to construction. Potential adverse, short-term impacts to wildlife would be minimal.

4.6.21.2.4 Marine and Estuarine Fauna

The alternative would not include any in-water work and would be limited to uplands. Therefore, due to lack of nearby marine and estuarine habitats, effects to species in these habitats would not be anticipated.

4.6.21.2.5 Invasive Species

Construction activities could result in the spread of invasive species near the alternative, which would be a minor, long-term impact to the surrounding environment. The Implementing Trustee would be responsible for controlling the spread of invasive species by following the Trustee's existing management policies or guidelines, as appropriate. If the Implementing Trustee does not have an existing policy for the management of invasive species, the Trustee may elect to implement best practices in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A).

4.6.21.3 SOCIOECONOMIC ENVIRONMENT

4.6.21.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a "disproportionately high and adverse" effect on a minority or low-income population. Vermilion Parish is not considered a minority or low-income population compared to elsewhere in the state; therefore, the alternative would not have a disproportionately adverse effect to minority or low-income communities. The alternative would provide a net benefit to nearby communities by providing improved and increased access to recreational activities, including fishing.

4.6.21.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to improve public access by car, boat, and foot to the recreational resources near the alternative. The proposed park facility improvements would allow anglers, wildlife viewers, and others to better reach the Vermilion River and other waterways connecting to the Gulf of Mexico. Overall, the alternative would serve to enhance the visitor experience over the long term, providing benefits to recreational users and other users.

4.6.21.3.3 Infrastructure

The alternative would not affect any highways, other major transportation networks, or other infrastructure. The alternative would improve existing infrastructure associated with recreational use by construction of a new group camp, new cabins, and new pavilions and enhancement of the existing trail system within the Palmetto Island State Park. Although the alternative would likely increase recreational use of the park, traffic on nearby roads would not be anticipated to increase substantially over existing conditions.

4.6.21.3.4 Cultural Resources

The alternative would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. Cultural and historic resources would be considered when preparing site-specific restoration measures and management actions. Potential impacts include ground disturbance associated with equipment movement, vegetation removal, vibration, or erosion. Impacts to portions of historic properties that damage characteristics that make them eligible for inclusion in the NRHP are long term and irretrievable. Where there is a likelihood of disturbance of cultural resources, cultural resource managers would conduct appropriate surveys to assess the methods and location of restoration and management actions. Restoration measures and management actions would be designed to avoid cultural resources to the extent practicable.

An archaeologist meeting the Secretary of the Interior's Professional Qualification Standards used the LDOA Louisiana Cultural Resources Map, a limited-access, online database, to conduct an archaeological records review of the immediate proposed footprint of the improvements and of Palmetto Island State Park. The entirety of the Palmetto Island State Park was surveyed for cultural resources in 1998 (LDOA Report No. 22-2172). The 1998 survey identified a number of natural levees and high areas within the park and extensively tested these areas (Ryan 1998). Two previously recorded archaeological sites (16VM70 and 16VM127) are within the park. Both sites have undetermined eligibility for the NRHP, but both were recommended for further investigation by a recent site assessment in 2012–2013 (Palmer 2013). Both sites lie close to Vermillion Bayou near a parking lot and boat ramp. No cultural resources were identified elsewhere in the park. Due to the recent survey of the park, it is unlikely that additional cultural resources survey would be required for the completion of the alternative.

4.6.21.3.5 Land Use and Agricultural Resources

The site for the alternative was acquired in 1981 by the State of Louisiana for the purpose of establishing the Palmetto Island State Park. The alternative is consistent with existing land use in the area, is designated as a state park, and would not adversely affect current land use.

Agricultural lands are not present on the alternative; therefore, there would be no known impacts to agricultural lands from the alternative.

4.6.21.4 AESTHETICS AND VISUAL RESOURCES

During construction, impacts on visual resources from the alternative would be adverse, minor, and short term, primarily because of the presence of construction personnel, equipment (e.g., fences, stockpiles), vehicles, and unfinished structures visible to the public and recreational users. Construction activities could detract from the overall visual environment at the site, but these activities would be short term. Even though existing viewsheds would be temporarily affected, these impacts would not dominate the view or detract from current user activities or experiences.

Implementation of the alternative would alter some areas of the park previously not developed by constructing a new group camp facility, additional cabins, and an event pavilion; however, these elements would enhance much of the park aesthetics and improve access to existing visual resources. The remainder of the elements would not adversely affect the site, which primarily consists of enhancing existing trails, access roads, and parking lots, because these features would largely remain the same. The alternative would not be out of character with previous site conditions and use. Long-term impacts would be beneficial, as improvements would improve site aesthetics and enhance access to visual resources.

4.6.21.5 PUBLIC HEALTH AND SAFETY

4.6.21.5.1 Noise

Noise associated with equipment during construction of a new group camp, new cabins, and new pavilions and enhancement of the existing trail system would result in short-term noise effects. Construction activities for the alternative would include mobilizing equipment, preparing the site, placing foundations, grading, and fill placement. Implementation of the alternative would include transportation of construction materials to the site, which may include trucks or other types of transportation that would contribute to short-term noise disturbances.

Human communities near the alternative may be affected by noise during construction of the proposed facilities. These activities are expected to be short term. Construction noise can also be a nuisance to residents living or recreating on the shorelines adjacent to construction activities. Construction activities

at the site would result in short-term, minor, adverse impacts to noise at the site and in the immediate vicinity. Standard practices, such as muffle units for generators, could be implemented during construction operations to mitigate noise impacts. Once the improvements are constructed, increased recreational use by visitors may cause some noise associated with parking and recreating. Overall, long-term noise impacts at the alternative from personal vehicle use and other recreational activities would likely be minor and adverse.

4.6.21.5.2 Resiliency

The alternative includes construction of a new group camp, new cabins, and new pavilions and enhancement of the existing trail system. The resiliency of the proposed structures to sustain sea-level rise, hurricanes, and storm surges would be determined during final design. To minimize adverse, long-term impacts to this environmental resource, several mitigation measures would be employed, as follows:

- The use of impervious materials would be avoided as much as feasible.
- Erosion and sedimentation control measures, including minimizing the amount of clearing and exposed soil, would be implemented and maintained.
- Sedimentation controls would be installed prior to the start of construction and maintained throughout the construction period.
- Disturbed areas would be revegetated with native species as soon as possible after work has been completed.

In addition, construction activities may temporarily impact the public health and safety of the alternative.

4.6.22 Louisiana Swamp Exhibit at Audubon Zoo

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. Due to the lack of ground disturbance associated with implementation of the alternative, the BMPs listed in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) and Section 4.3.1 would not apply to the alternative.

4.6.22.1 PHYSICAL ENVIRONMENT

4.6.22.1.1 Geology and Substrates

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on zoo grounds. Therefore, there would be no impacts to geology, soils, and substrates.

4.6.22.1.2 Hydrology and Water Quality

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on zoo grounds. Therefore, there would be no impacts to hydrology and water quality.

4.6.22.1.3 Air Quality and Greenhouse Gas Emissions

The alternative could result in localized air and GHG emissions if vehicle and/or equipment activity is necessary to install the exhibit on zoo grounds. However, because of the small scale and short duration of the installation portion of the activities, predicted emissions would be minor and short term and would not require a detailed assessment. No long-term, ongoing impacts would occur once the exhibit is operational.

4.6.22.2 BIOLOGICAL ENVIRONMENT

4.6.22.2.1 Terrestrial, Coastal-Nearshore, and Marine Habitats

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on previously disturbed upland zoo grounds. No coastal or marine habitat would be affected. Therefore, there would be no impacts to terrestrial, coastal-nearshore, or marine habitats.

4.6.22.2.2 Protected Species

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on zoo grounds that do not provide suitable habitat for protected species. Therefore, there would be no impacts to protected species or critical habitat.

4.6.22.2.3 Terrestrial Wildlife, including Migratory Birds

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on previously disturbed zoo grounds. Any vegetation clearing required would be minimal due to the small disturbance footprint. Existing vegetation may provide some roosting and foraging habitat for certain species, but that function is not anticipated to be adversely affected due to the current disturbed condition of the alternative. Additionally, the alternative does not specifically provide any special breeding, roosting, or foraging habitat for any migratory bird species. Therefore, there would be no adverse impacts to terrestrial wildlife, including migratory birds.

4.6.22.2.4 Marine and Estuarine Fauna

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on previously disturbed upland zoo grounds. No coastal or marine habitat would be affected. Therefore, there would be no impacts to marine and estuarine species.

4.6.22.2.5 Invasive Species

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on previously disturbed upland zoo grounds. Therefore, there would be no threat of spreading invasive species.

4.6.22.3 SOCIOECONOMIC ENVIRONMENT

4.6.22.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a “disproportionately high and adverse” effect on a minority or low-income population. Although the alternative is located in New Orleans, which contains a minority and low-income population, the alternative would not have a disproportionately adverse effect to these communities and, in fact, could provide a net benefit to local residents by providing additional public education and outreach opportunities.

4.6.22.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to promote public awareness of coastal resources and long-term stewardship via improvements to an existing tourism/recreation resource (i.e., the Louisiana Swamp exhibit). Indirectly, improved public connectedness to Gulf Coast resources could draw new visitors and residents to the region, thereby increasing recreation and tourism activity long term.

4.6.22.3.3 Infrastructure

The alternative would not directly impact existing recreation infrastructure. Indirectly, improved public connectedness to Gulf Coast resources could draw new visitors and residents to the region, thereby increasing demand for recreational access and facilities over time.

4.6.22.3.4 Cultural Resources

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on zoo grounds. Therefore, there would be no impacts to cultural resources.

4.6.22.3.5 Land Use and Agricultural Resources

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on zoo grounds. Therefore, the alternative would be consistent with existing land uses and would not impact any agricultural resources.

4.6.22.4 AESTHETICS AND VISUAL RESOURCES

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Louisiana Swamp exhibit on zoo grounds. Therefore, there would be no impacts to aesthetics and visual resources.

4.6.22.5 PUBLIC HEALTH AND SAFETY

4.6.22.5.1 Noise

Noise associated with equipment or vehicle activity during exhibit installation could result in localized, short-term noise effects. The alternative would be located on zoo grounds; therefore, no noise-sensitive receptors (e.g., private residences, schools, hospitals) would be impacted. Zoo visitors near the alternative could be affected by noise during installation, but these activities would be short term and consistent with other urban noise sources. No long-term, ongoing impacts would occur once the exhibit is operational.

4.6.22.5.2 Resiliency

The alternative would not be affected by or influence sea-level rise, hurricanes, and storm surges in the region. Therefore, there would be no change in resiliency if the alternative was implemented.

4.6.23 Louisiana Wetlands Gallery at Audubon Aquarium

The LA TIG is committed to avoiding and minimizing potential effects to resources that could result from implementation of any of the alternatives. Due to the lack of ground disturbance associated with implementation of the alternative, the BMPs listed in the Final PDARP/PEIS (DWH Trustees 2016:Section 6, Appendix A) and Section 4.3.1 would not apply to alternative.

4.6.23.1 PHYSICAL ENVIRONMENT

4.6.23.1.1 Geology and Substrates

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Mississippi River Gallery on aquarium grounds. Therefore, there would be no impacts to geology, soils, and substrates.

4.6.23.1.2 Hydrology and Water Quality

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Mississippi River Gallery on aquarium grounds. Therefore, there would be no impacts to hydrology and water quality.

4.6.23.1.3 Air Quality and Greenhouse Gas Emissions

The alternative could result in localized air and GHG emissions if vehicle and/or equipment activity is necessary to install the exhibit on aquarium grounds. However, because of the small scale and short duration of the installation portion of the alternative, predicted emissions would be minor and short term and would not require a detailed assessment. No long-term, ongoing impacts would occur once the exhibit is operational.

4.6.23.2 BIOLOGICAL ENVIRONMENT

4.6.23.2.1 Terrestrial, Coastal-Nearshore, and Marine Habitats

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Mississippi River Gallery on aquarium grounds. Therefore, there would be no impacts to terrestrial, coastal-nearshore, or marine habitats.

4.6.23.2.2 Protected Species

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Mississippi River Gallery on aquarium grounds. Therefore, there would be no impacts to protected species or critical habitat.

4.6.23.2.3 Terrestrial Wildlife, including Migratory Birds

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Mississippi River Gallery on aquarium grounds. Therefore, there would be no impacts to terrestrial wildlife, including migratory birds.

4.6.23.2.4 Marine and Estuarine Fauna

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Mississippi River Gallery on aquarium grounds. Therefore, there would be no impacts to marine and estuarine fauna.

4.6.23.2.5 Invasive Species

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Mississippi River Gallery on aquarium grounds. Therefore, there would be no threat of spreading invasive species.

4.6.23.3 SOCIOECONOMIC ENVIRONMENT

4.6.23.3.1 Socioeconomic Resources and Environmental Justice

Per EO 12898, for environmental justice to be a concern, the alternative would have a “disproportionately high and adverse” effect on a minority or low-income population. Although the alternative is located in New Orleans, which contains a minority and low-income population, the alternative would not have a disproportionately adverse effect to these communities and, in fact, could provide a net benefit to local residents by providing additional public education and outreach opportunities.

4.6.23.3.2 Tourism and Recreational Use, including Recreational Fishing and Hunting

The alternative would serve to promote public awareness of coastal resources and long-term stewardship via development of a new tourism/recreation activity (e.g., creation of the Louisiana Wetlands Gallery). Indirectly, improved public connectedness to Gulf Coast resources could draw new visitors and residents to the region, thereby increasing recreation and tourism activity long term.

4.6.23.3.3 Infrastructure

The alternative would not directly impact existing recreation infrastructure. Indirectly, improved public connectedness to Gulf Coast resources could draw new visitors and residents to the region, thereby increasing demand for recreational access and facilities over time.

4.6.23.3.4 Cultural Resources

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Mississippi River Gallery on aquarium grounds. Therefore, there would be no impacts to cultural resources.

4.6.23.3.5 Land Use and Agricultural Resources

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Mississippi River Gallery on aquarium grounds. Therefore, the alternative would be consistent with existing land uses and would not impact any agricultural resources.

4.6.23.4 AESTHETICS AND VISUAL RESOURCES

No new ground disturbance would be required for the alternative; all exhibit development would occur within the existing Mississippi River Gallery on aquarium grounds. Therefore, there would be no impacts to aesthetics and visual resources.

4.6.23.5 PUBLIC HEALTH AND SAFETY

4.6.23.5.1 Noise

Noise associated with equipment or vehicle activity during exhibit installation could result in localized, short-term noise effects. The alternative would be located on aquarium grounds; therefore, no noise-sensitive receptors (e.g., private residences, schools, hospitals) would be impacted. Aquarium visitors near the alternative could be affected by noise during installation, but these activities would be short term and consistent with other urban noise sources. No long-term, ongoing impacts would occur once the exhibit is operational.

4.6.23.5.2 Resiliency

The alternative would not influence, sea-level rise, hurricanes, and storm surges in the region and would be installed in existing infrastructure. Therefore, there would be no change in resiliency if the alternative was implemented.

4.7 Comparison of Impacts of the Alternatives

The alternatives would result in some adverse impacts to several environmental resources, mainly during construction. Most of these adverse impacts are expected to be short term and/or minor.

Long-term impacts to several of the environmental resources are expected to be beneficial because hydrology and water quality, terrestrial habitats, socioeconomic, and land use components are improved with implementation of the nutrient reduction alternatives. Long-term impacts to several of the environmental resources are expected to be beneficial because socioeconomic conditions, tourism, and infrastructure components are improved with implementation of the recreational use alternatives.

A summary of the environmental consequences to each resource for each of the alternatives and the No Action Alternative is provided in Table 4.7-1 for nutrient reduction alternatives and Table 4.7-2 for recreational use alternatives.

Table 4.7-1. Comparison of Impacts for the Nutrient Reduction Alternatives and No Action Alternative

Alternatives	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreation Use, including Recreational Fishing and Hunting	Infrastructure	Cultural Resources	Land Use and Agricultural Resources	Aesthetics and Visual Resources	Public Health and Safety
No Action Alternative	NE	L-	NE	L-	NE	NE	L-	NE	NE	NE	NE	NE	NE	NE L-	NE
Theme 1. Nutrient Reduction on Dairy Farms	S- L+	S- L+	NE	S- L+	S- L+	S- L+	NE	L-	L+	NE	NE	C	S+ L+	NE	S- L+
Theme 2. Nutrient Reduction on Crop and Grazing Land	S- L+	S- L+	NE	S- L+	S- L+	S- L+	NE	L-	L+	NE	NE	C	S+ L+	NE	S- L+
Theme 3. Winter Water Holding on Cropland	S- L+	S- L+	NE	S- L+	S- L+	S- L+	NE	L-	L+	NE L+	NE	C	S+ L+	NE	S- L+

Notes:

Adverse effect: -

Beneficial effect: +

Short-term effect: S

Long-term effect: L

No effect: NE

C: Consultation with the Louisiana SHPO to determine any additional requirements may be necessary if any ground disturbing activities are proposed outside the existing infrastructure footprints under the alternative.

Table 4.7-2. Comparison of Impacts for the Recreational Use Alternatives and No Action Alternative

Alternatives	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Cultural Resources	Land Use and Agricultural Resources	Aesthetics and Visual Resources	Public Health and Safety
No Action Alternative	NE	L-	NE	L-	NE	NE	L-	NE	NE	NE	NE	NE	NE	NE	NE
Pass-a-Loutre Wildlife Management Area Crevasse Access	L- L+	S- L+	S-	S- L+	S- L+	S- L+	S-	L-	L+	L+	S- L+	C	NE	S-	S- L+
Pass-a-Loutre Wildlife Management Area Campgrounds	S- L- +	S-	S-	S- L-	S-	S-	S-	L-	L+	L+	S- L+	C	NE	S- L+	S-
Grand Isle State Park Improvements	S- L- +	S-	S-	S- L-	S-	S-	S- L-	L-	L+	L+	L+	C	NE	S-	S-
Chitimacha Boat Launch	S- L-	S- L-	S-	S- L-	S-	S-	S- L-	L-	L+	L+	S- L+	C	NE	S- L+	S-
Sam Houston Jones State Park Improvements	S- L-	S-	S-	S-	NE	S-	NE	L-	L+	L+	S- L+	C	NE	S- L+	S- L-
PAC Rec Use Enhancement	S- L-	S- L-	S-	S- L-	S- L-	S- L-	S-	L-	L+	L+	S+ L+	C	NE	S- L+	S- L-
WHARF Phase 1	S- L-	S-	S-	S-	S-	S-	S- L-	L-	L+	L+	L- +	C	NE	S- L+	S- L-
Bayou Segnette State Park Improvements	S- L-	S-	S-	S-	NE	S-	NE	L-	L+	L+	L- +	C	NE	S- L+	S- L- +
Atchafalaya Delta Wildlife Management Area Access	S- L-	S-	S-	S- L+	S-	S- L+	S- L-	L-	L+	L+	L+	C	NE	S-	S-
Atchafalaya Delta Wildlife Management Area Campgrounds	S- L-	S-	S-	S- L-	S-	S-	S- L-	L-	L+	L+	L+	C	NE	S- L+	S- L-
Rockefeller Piers and Rockefeller Signage	S-	S-	S-	S- L-	S-	S-	S-	L-	L+	L+	L+	C	NE	S- L+	S- L-

Louisiana Trustee Implementation Group Draft Restoration Plan and Environmental Assessment #4:
 Nutrient Reduction (Nonpoint Source) and Recreational Use

Alternatives	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Cultural Resources	Land Use and Agricultural Resources	Aesthetics and Visual Resources	Public Health and Safety
St. Bernard State Park Improvements	S-	S- L-	S-	S-	NE	S-	NE	L-	L+	L+	L+	C	NE	S- L+	S- L-
Cypremort Point State Park Improvements	S- L- +	S-	S-	S- L- +	S-	S-	S-	L-	L+	L+	L+	C	NE	S- L+	S- L- +
The Wetlands Center	S- L-	S- L-	S-	S- L-	NE	S- L-	S-	L-	L+	L+	L+	C	NE	S- L- +	S- L-
Recreational Use Improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit	S- L-	S-	S-	S-	NE	S-	S-	L-	L+	L+	L+	C	NE	S-	S- L- +
Des Allemands Boat Launch	S- L-	S- L-	S-	S- L-	NE	S-	S-	L-	L+	L+	L+	C	NE	S- L- +	S- L-
Middle Pearl	S-	S- L-	S-	S- L-	S-	S-	S- L-	L-	L+	L+	L+	C	NE	S- L+	S- L-
Improvements to Grand Avoille Boat Launch	S- L-	S- L-	S-	S-	NE	S-	S-	L-	L+	L+	L+	C	NE	S- L+	S- L-
Belle Chasse	S- L-	S- L-	S-	S- L-	S-	NE	S-	L-	L+	L+	L+	C	NE	S- L+	S- L-
Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin	S-	S- L-	S-	S-	S-	S-	S-	L-	L+	L+	L+	C	NE	S-	S- L-

Louisiana Trustee Implementation Group Draft Restoration Plan and Environmental Assessment #4:
 Nutrient Reduction (Nonpoint Source) and Recreational Use

Alternatives	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Cultural Resources	Land Use and Agricultural Resources	Aesthetics and Visual Resources	Public Health and Safety
Palmetto Island State Park Improvements	S- L-	S-	S-	S- L-	NE	S-	NE	L-	L+	L+	L+	C	NE	S- L+	S- L-
Louisiana Swamp Exhibit at Audubon Zoo	NE	NE	NE	S-	NE	NE	NE	NE	L+	L+	NE	NE	NE	NE	S-
Louisiana Wetlands Gallery at Audubon Aquarium	NE	NE	NE	S-	NE	NE	NE	NE	L+	L+	NE	NE	NE	NE	S-

Notes:

Adverse effect: -

Beneficial effect: +

Short-term effect: S

Long-term effect: L

No effect: NE

C: Consultation with the Louisiana SHPO to determine any additional requirements may be necessary if any ground disturbing activities are proposed outside the existing infrastructure footprints under the alternative.

4.8 Preferred Alternatives

As discussed in Section 3.1.1, alternatives were initially screened based on OPA-defined criteria. Alternatives were also analyzed to determine the type and severity of potential environmental impacts that might result from the alternatives per NEPA.

The OPA and NEPA analyses were conducted for the reasonable range of 23 recreational use and eight nutrient reduction alternatives that would provide benefits to the physical environment, biological environment, and socioeconomic resources without causing substantial adverse impacts. Ultimately, the LA TIG identified alternatives that are preferred for implementation in this Draft RP/EA based on the OPA evaluation of cost-effectiveness or likelihood of success.

As a result of the OPA evaluation, 19 recreational use alternatives and four nutrient reduction alternatives are proposed by the LA TIG as preferred for implementation (Tables 4.8-1 and 4.8-2, respectively). As stated in the Final PDARP/PEIS, the No Action alternative “does not meet the purpose and need for restoration of injured resources and services” and therefore, is not identified as a preferred alternative.

Table 4.8-1. Nutrient Reduction Preferred Alternatives

Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes (as described under Theme 1)
Nutrient Reduction on Dairy Farms in Washington Parish (as described under Theme 1)
Nutrient Reduction on Cropland and Grazing Land in Bayou Folse (as described under Theme 2)
Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices (as described under Theme 3)

Table 4.8-2. Recreational Use Preferred Alternatives

Pass-a-Loutre Wildlife Management Area Campgrounds
Pass-a-Loutre Wildlife Management Area Crevasse Access
Grand Isle State Park Improvements
Chitimacha Boat Launch
Sam Houston Jones State Park Improvements
Pointe-aux-Chenes Wildlife Management Area Recreational Use Enhancement
WHARF Phase 1
Bayou Segnette State Park Improvements
Atchafalaya Delta Wildlife Management Area Access
Atchafalaya Delta Wildlife Management Area Campgrounds
Rockefeller Piers and Rockefeller Signage
St. Bernard State Park Improvements
Cypremort Point State Park Improvements
The Wetlands Center
Recreational Use Improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit
Des Allemands Boat Launch
Middle Pearl
Improvements to Grand Avoille Boat Launch
Belle Chasse

5 CUMULATIVE IMPACTS

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertake such other actions” (40 CFR 1508.7). The CEQ regulations to implement NEPA require the assessment of cumulative impacts be taken into consideration in the decision-making process for federal projects, plans, and programs. Cumulative impacts need to be analyzed in a meaningful manner that considers the specific resource, ecosystem, and human community being affected by the alternatives and should be considered for all alternatives, including the No Action Alternative (CEQ 1997).

The cumulative impacts analysis conducted for this RP/EA is consistent with CEQ regulations and considers the environmental impacts of the alternatives when added to impacts of past, present, and reasonably foreseeable future actions in each alternative’s impact zone. Additionally, Section 6.6 and Appendix 6B of the Final PDARP/PEIS are incorporated by reference into the following cumulative impacts analysis. The multistep approach used for evaluating cumulative impacts for this RP/EA is consistent with the methodology used in the Final PDARP/PEIS and subsequent documents and is described below.

5.1 Cumulative Impacts Methodology

5.1.1 *Establishing Groups for Analysis*

The broad geographic scope and number of individual alternatives considered in this RP/EA pose unique challenges in assessing cumulative impacts in a manner that is meaningful to decision-making. Additionally, given the variety in the types of impacts and degree to which impacts to various resources from each of the alternatives are expected, a practical and feasible means to evaluate cumulative impacts had to be developed.

Independent cumulative impacts analyses for individual alternatives were determined to be impractical given the proximity of some alternatives and high number of other actions in the vicinity. Individual alternative assessments would also result in a significant amount of repetition in the document. Consistent with the Final PDARP/PEIS and DWH Oil Spill restoration efforts, the nutrient reduction alternatives considered in this RP/EA are targeting restoring habitat and resource conditions within Louisiana watersheds, thus, improving water quality in coastal environments affected by the spill. Therefore, the alternatives for nutrient reduction and recreational use were grouped in a manner consistent with major Louisiana watersheds. USGS HUCs were identified as a means to accomplish this goal (NRCS 2007). Based on the spatial distribution of the alternatives and the goal to have meaningful groups, the areas designated at six-digit HUCs were determined the most practical grouping approach (Figure 5.1-1).

Grouping the alternatives in this manner resulted in a total of eight groups, ranging between one and 11 alternatives per group (Table 5.1-1). The remaining sections describe how the alternatives were evaluated for cumulative impacts, using the eight groups.



Figure 5.1-1. Groups of alternatives used for cumulative impact analysis.

Table 5.1-1. Alternatives Grouped by Six-Digit Hydrologic Unit Codes

Alternative Name	Alternative Type
Group 1: Pearl HUC 031800	
Nutrient Reduction on Dairy Farms in Washington Parish	Nutrient reduction
Middle Pearl	Recreational use
Group 2: Lake Pontchartrain HUC 080902	
Louisiana Wetlands Gallery at Audubon Aquarium	Recreational use
St. Bernard State Park Improvements	Recreational use
Group 3: Lake Maurepas HUC 080702	
Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes	Nutrient reduction
Group 4: Central Louisiana Coastal HUC 080903	
Louisiana Swamp Exhibit at Audubon Zoo	Recreational use
Bayou Segnette State Park Improvements	Recreational use
WHARF Phase 1	Recreational use
Recreational Use Improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit	Recreational use
Belle Chasse	Recreational use
The Wetlands Center	Recreational use
Des Allemands Boat Launch	Recreational use
Nutrient Reduction on Cropland and Grazing Land in Bayou Folse	Nutrient reduction
Pointe-aux-Chenes Wildlife Management Area Recreational Use Enhancement	Recreational use
Grand Isle State Park Improvements	Recreational use
Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin	Recreational use
Group 5: Lower Mississippi New Orleans HUC 080901	
Pass-a-Loutre Wildlife Management Area Crevasse Access	Recreational use
Pass-a-Loutre Wildlife Management Area Campgrounds	Recreational use
Group 6: Atchafalaya Vermillion HUC 080801	
Grand Avoille Boat Launch	Recreational use
Chitimacha Boat Launch	Recreational use
Palmetto Island State Park Improvements	Recreational use
Cypremort Point State Park Improvements	Recreational use
Atchafalaya Delta Wildlife Management Area Campgrounds	Recreational use
Atchafalaya Delta Wildlife Management Area Access	Recreational use
Nutrient Reduction and Management on Cropland and Grazing Lands in Iberia, St. Mary, and Vermilion Parishes	Nutrient reduction
Group 7: Calcasieu Mermentau HUC 080802	
Sam Houston Jones State Park Improvements	Recreational use
Rockefeller Piers and Rockefeller Signage	Recreational use
Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices	Nutrient reduction
Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes	Nutrient reduction
Group 8: Lower Red HUC 080403	
Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes	Nutrient reduction
Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes	Nutrient reduction

5.1.2 Step 1: Identify Resources

In this step, each resource affected by the alternatives within a HUC Group is identified. For the purposes of this evaluation, the direct and indirect impacts for each alternative within each group were summarized in tabular format and presented in the following evaluation sections. Potential alternative-related impacts are represented as being either short- or long-term adverse or beneficial impacts. In the case that direct and indirect analyses conclude that a particular resource is not affected by the alternatives within a group, that or those resource(s) were not included in the cumulative impact analysis for that group. Although short-term impacts are expected to be spread out over time and not contribute significantly to cumulative impacts in each group, these resources remain in the cumulative impact analysis for each group.

Nutrient reduction alternatives would be reviewed for cultural resource effects prior to construction of CPs. No effects determinations have been made at this time. Consultation would occur as necessary as part of this voluntary program administered by USDA. Recreational use alternatives would be required to consult with the Louisiana SHPO, depending on the presence of known cultural resources. Because of the unknowns associated with potential impact to cultural resources and because the Louisiana SHPO and tribes would be consulted for all alternatives, as necessary, this category was excluded from consideration in the cumulative analysis.

5.1.3 Step 2: Establish Boundaries

Consistent with CEQ guidance (CEQ 1997), affected resource-specific spatial and temporal boundaries must be established in order to identify past, present, and reasonably foreseeable future actions for consideration in the cumulative impact analysis. For the purposes of this analysis, spatial boundaries are defined by group, while temporal boundaries are consistent for all alternatives considered, as described below.

The spatial boundary is the defined area in which past, present, and reasonably foreseeable future actions have taken place, are taking place, or could take place and result in cumulative impacts on the affected resources when combined with the alternatives within a group being considered. For this analysis, the spatial boundaries are defined slightly differently for nutrient reduction compared to recreational use alternatives. For nutrient reduction alternatives, the spatial boundary of analysis includes the affected 12-digit HUC for each alternative and immediate areas. For recreational use alternatives, the spatial boundary of analysis includes those areas where each alternative within a group would occur and adjacent vicinities. In instances in which few to no alternatives were identified within these spatial boundaries, the types of alternatives typical to the six-digit HUC in the alternatives group were considered, as was professional judgement and a working knowledge of efforts within the region.

The temporal boundary of analysis describes how far into the past and forward into the future actions should be considered in the cumulative impact analysis. CEQ guidance on consideration of past actions notes that past actions should only be considered insofar as it informs agency decision making and that listing or analyzing the effects of individual past actions is not necessary unless such information is needed to describe the cumulative effect of all past actions (CEQ 2005). Therefore, it is typical that effects of past actions are combined rather than discussed individually and only past actions that continue to have current cumulative impact effects on the affected resources being evaluated are considered in the cumulative impact analysis. Because past actions have led to the condition that is currently present in the environment, it is generally accepted that, with few exceptions, past actions are captured in the description of existing conditions in the affected environment sections of a NEPA document.

Present actions are those that are actively occurring and result in impacts on the same resources within the same spatial boundary as the alternatives being considered. Reasonably foreseeable future actions are those that are likely to occur and affect the same resource as the alternatives. The likelihood of a future action to occur must be determined in a manner that allows a level of certainty and is typically met based on completion of permit application, inclusion of approved proposals or planning documents, or other similar evidence. Determination of how far into the future to consider such actions is based on the impact of the alternatives being considered. For this RP/EA, reasonably foreseeable future actions are considered separately for nutrient reduction and recreational use alternatives. For nutrient reduction alternatives, the temporal boundary of analysis extends until funding for Louisiana nutrient reduction alternatives is depleted. The estimated timeframe for use of such funds is approximately 8 years from the signing of the RP/EA decision. For recreational use alternatives, the temporal boundary of analysis extends to the limit of funding for Louisiana recreational use alternatives is depleted. It should be noted that upon completion of alternatives implemented as approved in this RP/EA, only minor funding for recreational use alternatives in Louisiana would remain.

5.1.4 Step 3: Identify Cumulative Action Scenarios

The cumulative action scenario describes the types of past, present, and reasonably foreseeable future actions that are included in the cumulative impact analysis for each affected resource identified within a group. The actions fall within the spatial and temporal boundaries established for the analysis and, for the purposes of this analysis, are grouped consistent with the categories considered in the Final PDARP/PEIS and subsequent RP/EAs. Categories consistent with the Final PDARP/PEIS that had no applicable actions for the analysis within each group were not included in the tables. Because actions are grouped by general project type, the impact assessment for each action reflects the types of short- and long-term impacts that can be expected from the activities generally associated with that type of action.

The scenario for each group was identified by obtaining LDNR Coastal Management project information from the Strategic Online Natural Resources Information System database (LDNR 2018). The alternatives are primarily coastal; therefore regulations pertaining to coastal actions were considered in developing the scenario for each group. Therefore, project information within the spatial boundaries defined for each group (essentially the defined alternative area or 12-digit HUC, with an approximate 1-mile buffer) were obtained. Additional sources considered include other restoration projects related to the DWH Oil Spill and projects from the 2017 CPRA Master Plan (CPRA 2017) that share the same spatial and temporal boundaries for each group considered. Based on the information obtained, the types of past, present, and future activities were categorized and summarized by group. All projects identified were either determined to be major actions to be considered independently or generalized by activity type. CPRA Master Plan projects that were generalized were categorized consistent with how they were defined in the Master Plan (e.g., structural protection, shoreline protection, barrier island restoration, and marsh creation).

5.1.5 Step 4: Cumulative Impacts Analysis

The final step in the cumulative impact analysis is determining the incremental impact of the alternatives (X), when added to the impacts from applicable past, present and reasonably foreseeable future actions (Y), yielding the potential cumulative impacts of the alternatives and applicable actions identified in the scenario for each group on the affected resources identified for that group (Z). Consistent with the Final PDARP/PEIS and subsequent RP/EAs, this is simply stated as $X + Y = Z$.

Cumulative impact analysis was accomplished by considering the type of impacts associated with each action in the scenario identified for that group and for the resources potentially impacted by alternatives in that group. Results are presented in tabular format for each group, similar to how affected resources were identified and presented for each group (see Step 1), by identifying short- and long-term adverse and beneficial impacts anticipated to result from each activity. This allows identification of potential adverse cumulative impacts in resource categories where impacts from past, present, and reasonably foreseeable future actions might overlap those of the group alternatives. Additionally, this information essentially represents the cumulative impact scenario for the No Action Alternative for the resources identified for analysis within each group.

For most instances, the LA TIG anticipate that short-term impacts would be spread out over time, thus not resulting in substantial adverse cumulative impacts.

5.2 Cumulative Impacts Analysis

5.2.1 Group 1: Pearl HUC

Group 1 consists of two alternatives: one nutrient reduction alternative and one recreational use alternative (Table 5.2-1).

5.2.1.1 AFFECTED RESOURCES

Resource impacts associated with Group 1 alternatives are summarized in Table 5.2-1. In general, long-term impacts for Group 1 alternatives are positive for most resources or there would be adverse effects for one alternative and beneficial for the other. Adverse, short-term impacts are expected for air quality and invasive species. Land use and agricultural resources would not be affected by Group 1 alternatives; thus, this category has been removed from consideration in Group 1 cumulative effects analysis.

5.2.1.2 CUMULATIVE ACTION SCENARIOS

Based on review of information available for Group 1, the types of projects and actions identified are summarized in Table 5.2-2.

Table 5.2-1. Summary of Impacts of Alternatives in Group 1

Alternatives	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Land Use and Agricultural Resources	Aesthetics and Visual Resources	Public Health and Safety
Nutrient Reduction on Dairy Farms in Washington Parish	S- L+	S- L+	NE	S -L+	S -L+	S- L+	NE	L-	L+	NE	NE	S+ L+	NE	S- L+
Middle Pearl	S-	S- L-	S-	S- L-	S-	S-	S- L-	L-	L+	L+	L+	NE	S- L+	S- L-

Notes:

Adverse effect: -

Beneficial effect: +

Short-term effect: S

Long-term effect: L

No effect: NE

Shaded columns represent resource categories removed from consideration for that group.

Table 5.2-2. Other Actions in Group 1 Identified for Cumulative Impacts Analysis

Category of Projects Considered for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, Including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Public Health and Safety
Energy Activities													
Oil and gas pipeline and well activity	S-	S-	S-	S-L-	S-	S-L-	S-	L-	S+L+	S-L+/-	S-L+	L-	NE
Dredged Material Disposal													
Drainage maintenance and improvement projects	S-	S-L+	S-	S-L-	NE	S-	NE	L-	S+L+	NE	L+	S-	L+
Coastal Development and Land Use													
Nonstructural risk reduction projects (CPRA MP)	NE	NE	NE	NE	NE	NE	NE	NE	L+	NE	L+	NE	L+
Marsh creation project (CPRA MP)	S-	S-L+	S-	S-L+	NE	S-L+	S-L+	NE	NE	S-L+	NE	S-L+	NE
Commercial, residential, and other development	S-	S-L-	S-	S-L-	NE	S-L-	S-	S-L-	S+L+	NE	S-L-	S-L-	NE
Roadway improvement and maintenance	S-	S-	S-	S-	NE	S-L-	S-	S-	S+	NE	L+	S-	S-L+

Notes:
 Adverse effect: -
 Beneficial effect: +
 Short-term effect: S
 Long-term effect: L
 No effect: NE

5.2.1.3 CUMULATIVE IMPACTS ANALYSIS

Table 5.2-2 identifies the resource categories where there is a possibility that impacts of present and reasonably foreseeable future actions might overlap those of the Group 1 alternatives and, therefore, result in adverse cumulative impacts. Generally speaking, cumulative impacts for Group 1 would be expected to result in potential adverse, long-term impacts to terrestrial habitats and wildlife caused by direct conversion of habitat. Other actions could also result in potential adverse, long-term impact due to increased potential to spread or introduce invasive species, and the alternatives in Group 1 would contribute short-term incremental impacts to potential spread of invasive species. Group 1 alternatives could incrementally contribute to long-term beneficial effects in the area to socioeconomic, tourism and recreation, infrastructure, and public health and safety. Potential long-term impacts to other resources (geology, hydrology and water quality, and coastal and nearshore habitats) would be both adverse and beneficial over the long term.

5.2.2 Group 2: Lake Pontchartrain HUC

Group 2 consists of two recreational use alternatives (Table 5.2-3). It should be noted that the Louisiana Wetlands Gallery at Audubon Aquarium Alternative would not involve any construction activities, as it entails revision of an existing facility for a new gallery concept.

5.2.2.1 AFFECTED RESOURCES

Resource impacts associated with Group 2 alternatives are summarized in Table 5.2-3. In general, both short-term and long-term impacts for Group 2 alternatives are associated with the St. Bernard State Park Improvements alternative, with the exception of anticipated long-term beneficial effects to socioeconomic and tourism/recreation from both alternatives. Adverse, long-term effects to geology and substrates would be minor and limited to the footprint of new features. Multiple resources would be affected by short-term impacts during construction. Protected species, coastal species, and land use and agricultural resources would not be affected by Group 2 alternatives, thus this category has been removed from consideration in Group 2 cumulative effects analysis.

5.2.2.2 CUMULATIVE ACTION SCENARIOS

Based on review of information available for Group 2, the types of projects and actions identified are summarized in Table 5.2-4.

Table 5.2-3. Summary of Impacts of Alternatives in Group 2

Alternatives	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Louisiana Wetlands Gallery at Audubon Aquarium	NE	NE	NE	S-	NE	NE	NE	NE	L+	L+	NE	NE	NE	S-
St. Bernard State Park Improvements	S-	S- L-	S-	S-	NE	S-	NE	L-	L+	L+	L+	S- L+	NE	S- L-

Notes:

Adverse effect: -

Beneficial effect: +

Short-term effect: S

Long-term effect: L

No effect: NE

Shaded columns represent resource categories removed from consideration for that group.

Table 5.2-4. Other Actions in Group 2 identified for Cumulative Impacts Analysis

Category of Projects Considered for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Terrestrial Wildlife, including Migratory Birds	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Public Health and Safety
Tourism and Recreation											
Park upgrades-walk/bike paths, lighting	S- L-	S- L-	S-	S- L-	S- L-	S- L-	S- L+	S- L+	L+	S- L+	S- L+
Marine Transportation											
Maintenance dredging, floating barge dock and platforms,	S- L-	S- L-	S-	S- L-	S- L+	S-	S+ L+	S-	L+	S-	S- L-
Energy Activities											
Oil and gas pipeline and well activity	S-	S-	S-	S- L-	S- L-	S- L-	S+ L+	S- L+/-	S- L+	L-	NE
Marine Mineral Mining, Including Sand and Gravel Mining											
Excavation for borrow and composting	S- L-	S- L-	S-	S-	S- L-	S- L-	NE	NE	NE	L-	NE
Dredged Material Disposal											
Drainage maintenance and improvement projects	S-	S- L+	S-	S- L-	S-	S-	S+ L+	NE	L+	S-	L+
Levee construction and maintenance	S-	S- L+/-	S-	S- L+/-	S- L+/-	S-	S+ L+	S- L+	L+	S-	L+
Placement of maintenance and new work dredged material	S- L-	S-	S-	S- L-	S- L+	S- L-	NE	S- L+/-	NE	S- L+	NE

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Category of Projects Considered for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Terrestrial Wildlife, including Migratory Birds	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Public Health and Safety
Coastal Development and Land Use											
Nonstructural risk reduction projects (CPRA MP)	NE	NE	NE	NE	NE	S-	L+	NE	L+	NE	L+
Sediment diversions (CPRA MP)	S- L+/-	S- L+/-	S-	S- L+/-	S- L+/-	S- L+/-	L+/-	S- L+/-	S- L+	S-	S- L+/-
Marsh creation projects (CPRA MP)	S-	S- L+	S-	S- L+	S- L+	S-	NE	S- L+	NE	S- L+	NE
Structural protection (CPRA MP)	S-	S- L-	S-	S- L-	S-	S-	S+ L+	S- L+	L+	S-	L+
Commercial, residential, and other development	S-	S- L-	S-	S- L-	S- L-	S- L-	S+ L+	NE	S- L-	S- L-	NE
Roadway improvement and maintenance	S-	S-	S-	S-	S- L-	S- L-	S+	NE	L+	S-	S- L+
Fisheries and Aquaculture											
Caernarvon bass rearing fish ponds	S- L-	S-	S-	S-	S-	S-	S+ L+	L+	NE	NE	NE

Notes:

Adverse effect: -

Beneficial effect: +

Short-term effect: S

Long-term effect: L

No effect: NE

5.2.2.3 CUMULATIVE IMPACTS ANALYSIS

Generally speaking, cumulative impacts for Group 2 are expected to result in potential adverse, long-term impacts to geology and substrates caused by direct conversion to impervious areas and to invasive species, primarily from increased edge habitat allowing for establishment of invasive flora and fauna (Table 5.2-4). However, the alternatives in Group 2 would not contribute to those impacts, other than potential for short term, minor impact during construction activities. One of the Group 2 projects could have a small incremental contribution to adverse, long-term impacts to hydrology and water quality, primarily from risk of accidental spills from boats. Other actions in the area have both adverse and beneficial effects to water quality and hydrology, with both beneficial and adverse cumulative impacts expected and adverse effects expected to be minor. Potential beneficial long-term impacts in the area could occur to multiple resources, and both alternatives in Group 2 would also contribute to beneficial impact to those resources (socioeconomic, tourism and recreation, and infrastructure), with the exception of public health and safety. Potential long-term impacts to terrestrial and coastal habitats and wildlife would be both adverse and beneficial, while Group 2 alternatives do not contribute to long-term impacts to those resources.

5.2.3 Group 3: Lake Maurepas HUC

Group 3 consists of one proposed nutrient reduction alternative.

5.2.3.1 AFFECTED RESOURCES

Resource impacts associated with Group 3 are summarized in Table 5.2-5. In general, both short-term and long-term impacts for Group 3 are expected to be fairly minor. No adverse, long-term effects would be anticipated. Multiple resources would be affected by short-term impacts during construction. Air quality, coastal species, tourism and recreation, and infrastructure would not be affected by the Group 3 alternative, thus these categories have been removed from consideration in Group 3 cumulative effects analysis.

5.2.3.2 CUMULATIVE ACTION SCENARIOS

Based on review of information available for Group 3, the types of projects and actions identified are summarized in Table 5.2-6.

Table 5.2-5. Summary of Impacts of Alternative in Group 3

Alternatives	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Nutrient Reduction on Dairy Farms in St. Helena and Tangipahoa Parishes	S- L+	S- L+	NE	S- L+	S- L+	S- L+	NE	L-	L+	NE	NE	NE	S+ L+	S- L+

Notes:

Adverse effect: -

Beneficial effect: +

Short-term effect: S

Long-term effect: L

No effect: NE

Shaded columns represent resource categories removed from consideration for that group.

Table 5.2-6. Other Actions in Group 3 Identified for Cumulative Impacts Analysis

Category of Projects Considered for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Invasive Species	Socioeconomic Resources and Environmental Justice	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Tourism and Recreation											
WMA management activities	NE	L+/-	NE	L+	L+/-	L+	L+	L+	NE	NE	NE
Energy Activities											
Oil and gas pipeline activity	S-	S-	S-	S- L-	S- L-	S- L-	L-	S+ L+	L-	S- L+/-	NE
Development and Land Use											
Logging activities (silviculture)	S- L-	S-	S-	S- L+/-	S- L+/-	S- L+/-	S- L-	S+ L+	L-	NE	S-
Commercial, residential, and other development (rural)	S-	S- L-	S-	S- L-	S- L-	S- L-	S- L-	S+ L+	S- L-	NE	NE
Roadway improvement and maintenance	S-	S-	S-	S-	S- L-	S- L-	S-	S+ L+	S-	S-	S- L+

Notes:
 Adverse effect: -
 Beneficial effect: +
 Short-term effect: S
 Long-term effect: L
 No effect: NE

5.2.3.3 CUMULATIVE IMPACTS ANALYSIS

Generally speaking, cumulative impacts from actions in Group 3 are expected to result in potential adverse, long-term impacts to geology and substrates, hydrology and water quality, terrestrial habitat and wildlife, protected species, and invasive species (see Table 5.2-6). In general, these adverse, long-term impacts would occur from logging and oil and gas activity, general development, and roadway improvement and maintenance within the area, with the alternative not contributing to long-term negative effects. Alternatives in Group 3 could incrementally contribute to long-term beneficial effects in the area for land use and agricultural resources, as well as public health and safety.

5.2.4 Group 4: Central Louisiana Coastal HUC

Group 4 consists of 11 alternatives: one nutrient reduction alternative and 10 recreational use alternatives (Table 5.2-7).

5.2.4.1 AFFECTED RESOURCES

Resource impacts associated with Group 4 alternatives are summarized in Table 5.2-7. In general, both short-term and long-term impacts for Group 4 alternatives are associated with most resources, with the exception of invasive species, which would only experience adverse, short-term impacts. Adverse, long-term effects to resources are expected to be minor, primarily associated with increased human activity, direct conversion of habitat to small structures, or risk of spills from watercraft. Overall, beneficial long-term impacts are expected for socioeconomics, tourism and recreation, infrastructure, land use, and public health and safety. Multiple resources would be affected by short-term impacts during construction.

5.2.4.2 CUMULATIVE ACTION SCENARIOS

Based upon review of information available for Group 4, the types of projects and actions are reflected in Table 5.2-8.

Table 5.2-7. Summary of Impacts of Alternatives in Group 4

Alternatives	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Nutrient Reduction on Cropland and Grazing Land in Bayou Folse	S- L+	S- L+	NE	S- L+	S- L+	S- L+	NE	L-	L+	NE	NE	NE	S+ L+	S- L+
Bayou Segnette State Park Improvements	S- L-	S-	S-	S-	NE	S-	NE	L-	L+	L+	L- +	S- L+	NE	S- L- +
Louisiana Swamp Exhibit at Audubon Zoo	NE	NE	NE	S-	NE	NE	NE	NE	L+	L+	NE	NE	NE	S-
WHARF Phase 1	S- L-	S-	S-	S-	S-	S-	S- L-	L-	L+	L+	L+-	S- L+	NE	S- L-
Recreational Use improvements at Barataria Preserve in Jefferson Parish, Jean Lafitte National Historical Park and Preserve, Barataria Preserve Unit	S- L-	S-	S-	S-	NE	S-	S-	L-	L+	L+	L+	S-	NE	S- L- +
Belle Chasse	S- L-	S- L-	S-	S- L-	S-	NE	S-	L-	L+	L+	L+	S- L+	NE	S- L-
The Wetlands Center	S- L-	S- L-	S-	S- L-	NE	S- L-	S-	L-	L+	L+	L+	S- L- +	NE	S- L-
Des Allemands Boat Launch	S- L-	S- L-	S-	S- L-	S-	S-	S-	L-	L+	L+	L+	S- L- +	NE	S- L-

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Pointe-aux-Chenes Wildlife Management Area Recreational Use Enhancement	S- L-	S- L-	S-	S- L-	S- L-	S- L-	S-	L-	L+	L+	S+ L+	S- L+	NE	S- L-
Grand Isle State Park Improvements	S- L- +	S-	S-	S- L-	S-	S-	S- L-	L-	L+	L+	L+	S-	NE	S-
Caminada Pass Bridge Fishing Pier Restoration, Jefferson Parish, Region 2, Barataria Basin	S-	S- L-	S-	S-	S-	S-	S-	L-	L+	L+	L+	S-	NE	S- L-

Notes:

- Adverse effect: -
- Beneficial effect: +
- Short-term effect: S
- Long-term effect: L
- No effect: NE

Table 5.2-8. Other Actions in Group 4 Identified for Cumulative Impacts Analysis

Category of Projects consider for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Restoration Related to the DWH Oil Spill														
Mid-Barataria Sediment Diversion project	S- L+/-	S- L+/-	S-	S- L+/-	S- L+/-	S- L+/-	S- L+/-	S-	L+/-	S- L+/-	S- L+	S-	S- L+/-	S- L+/-
Large-scale marsh creation: Component E projects	S- L+	S- L+	S-	S- L+	S- L+	S- L+	S- L+	S-	NE	S- L+/-	NE	S- L+	NE	L+
Tourism and Recreation														
Park upgrades-walk/bike paths, lighting	S- L-	S- L-	S-	S- L-	S-	S- L-	S- L-	S-	S- L+	S- L+	L+	S- L+	NE	S- L+
Marine Transportation														
Dredging, floating barge dock and platforms,	S- L-	S- L-	S-	S- L-	S- L-	S- L+	S- L-	S- L-	S+ L+	S-	L+	S-	NE	S- L-
Energy Activities														
Oil and gas pipeline and well activity	S-	S-	S-	S- L-	S-	S- L-	S-	L-	S+ L+	S- L+/-	S- L+	L-	S- L-	NE
Marine Mineral Mining, Including Sand and Gravel Mining														
Excavation for borrow	S- L-	S- L-	S-	S-	S-	S- L-	S- L-	S- L-	NE	NE	NE	L-	S- L-	NE
Dredged Material Disposal														
Drainage maintenance and improvement projects	S-	S- L+	S-	S- L-	NE	S-	NE	L-	S+ L+	NE	L+	S-	S- L+	L+
Levee construction and maintenance	S-	S- L+/-	S-	S- L+/-	NE	S- L+/-	S- L+/-	S-	S+ L+	S- L+	L+	S-	S- L+/-	L+
Placement of maintenance and new work dredged material	S- L-	S-	S-	S- L-	S-	S- L+	S- L-	S- L-	NE	S- L+/-	NE	S- L+	NE	NE

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Category of Projects consider for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Coastal Development and Land Use														
Nonstructural risk reduction projects (CPRA MP)	NE	NE	NE	NE	NE	NE	NE	NE	L+	NE	L+	NE	NE	L+
Sediment diversions (CPRA MP)	S- L+/-	S- L+/-	S-	S- L+/-	S- L+/-	S- L+/-	S- L+/-	S-	L+/-	S- L+/-	S- L+	S-	S- L+/-	S- L+/-
Marsh creation projects (CPRA MP)	S-	S- L+	S-	S- L+	NE	S- L+	S- L+	NE	NE	S- L+	NE	S- L+	NE	L+
Hydrologic restoration (CPRA MP)	S-	S- L+	S-	S- L+	NE	S- L+/-	S- L+/-	S- L-	NE	S- L+	S- L+	S- L+	NE	L+
Structural protection (CPRA MP)	S- L+/-	S- L-	S-	S- L-	NE	S-	S- L-	S-	S+ L+	S- L+	L+	S-	L+	L+
Shoreline protection (CPRA MP)	S- L+/-	S- L+/-	S-	S- L+	S- L+/-	S- L+	S- L+/-	NE	NE	S- L+	NE	S- L+	NE	L+
Ridge restoration (CPRA MP)	S- L+	S- L+	S-	S- L+	NE	S- L+	S- L+	S-	NE	NE	NE	S- L+	NE	L+
Commercial, residential, and other development	S-	S- L-	S-	S- L-	NE	S- L-	S-	S- L-	S+ L+	NE	S- L-	S- L-	S-	NE
Roadway and rail improvement and maintenance	S- L-	S- L-	S- L-	S- L-	NE	S- L-	S-	S-	S+ L+	NE	L+	S-	S- L+/-	S- L+
Fisheries and Aquaculture														
Creation and maintenance of crawfish ponds and associated facilities	S-	S-	S-	NE	NE	S- L+	NE	NE	L+	NE	NE	NE	NE	NE

Notes:
 Adverse effect: -
 Beneficial effect: +
 Short-term effect: S
 Long-term effect: L
 No effect: NE

5.2.4.3 CUMULATIVE IMPACTS ANALYSIS

Generally speaking, cumulative impacts for Group 4 are expected to result in potential adverse, long-term impacts that are primarily minor in nature and associated with infrastructure improvement and activities common in the area, such as excavation for borrow material and dredging activities (see Table 5.2-8). Long-term beneficial impacts could result from other activities in the area aimed at coastal restoration and drainage improvement. Alternatives in Group 4 could provide an incremental contribution to long-term beneficial effects to socioeconomics, tourism and recreation, land use, and public health and safety in the area.

5.2.5 Group 5: Lower Mississippi New Orleans HUC

Group 5 consists of two recreational use alternatives (Table 5.2-9).

5.2.5.1 AFFECTED RESOURCES

Resource impacts associated with Group 5 alternatives are summarized in Table 5.2-9. In general, both short-term and long-term impacts for Group 5 alternatives are associated with most resources, with the exception of land use and agricultural resources, which are not expected to be affected, and air quality, protected species, and invasive species, which would only experience adverse, short-term impacts. Adverse, long-term effects to resources are expected to be minor, primarily associated with increased human activity, direct conversion of habitat to small structures, or increased waste or improperly disposed fishing gear from recreational use. Overall, beneficial long-term impacts are expected for most resources, primarily due to reduced erosion, increased water quality, and improved recreational opportunities. Multiple resources would be affected by short-term impacts during construction. Because no impacts are expected for land use and agricultural resources, this category was removed from consideration in the cumulative assessment for Group 5.

5.2.5.2 CUMULATIVE ACTION SCENARIOS

Based upon review of information available for Group 5, the types of projects and actions are reflected in Table 5.2-10.

Table 5.2-9. Summary of Impacts of Alternatives in Group 5

Alternatives	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Pass-a-Loutre Wildlife Management Area Crevasse Access	L- L+	S- L+	S-	S- L-	S- L+	S- L+	S-	L-	L+	L+	S- L+	S-	NE	S- L+
Pass-a-Loutre Wildlife Management Area Campgrounds	S- L- +	S-	S-	S- L-	S-	S-	S-	L-	L+	L+	S- L+	S- L+	NE	S-

Notes:

Adverse effect: -

Beneficial effect: +

Short-term effect: S

Long-term effect: L

No effect: NE

Shaded columns represent resource categories removed from consideration for that group.

Table 5.2-10. Other Actions in Group 5 Identified for Cumulative Impacts Analysis

Category of Projects consider for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Public Health and Safety
Tourism and Recreation													
Delta National Wildlife Refuge maintenance	S-	NE	S-	L+	NE	L+	L+	L+	NE	L+	NE	S- L+	L+
Marine Transportation													
Dredging, floating barge dock and platforms, slip maintenance, and propwash	S- L-	S- L-	S-	S- L-	S- L-	S- L+	S- L-	S- L-	S+ L+	S-	L+	S-	S- L-
Energy Activities													
Oil and gas pipeline and well activity	S-	S-	S-	S- L-	S-	S- L-	S-	L-	S+ L+	S- L+/-	S- L+	L-	NE
Marine Mineral Mining, Including Sand and Gravel Mining													
Excavation for borrow	S- L-	S- L-	S-	S-	S-	S- L-	S- L-	S- L-	NE	NE	NE	L-	NE
Dredged Material Disposal													
Drainage maintenance and improvement projects	S-	S- L+	S-	S- L-	NE	S-	NE	L-	S+ L+	NE	L+	S-	L+
Levee construction and maintenance	S-	S- L+/-	S-	S- L+/-	NE	S- L+/-	S- L+/-	S-	S+ L+	S- L+	L+	S-	L+
Placement of maintenance and new work dredged material	S- L-	S-	S-	S- L-	S-	S- L+	S- L-	S- L-	NE	S- L+/-	NE	S- L+	NE
Beneficial use of dredged material	S-	S- L+	S-	S- L+	NE	L+	S- L+	S-	NE	S- L+	NE	L+	NE

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 Nutrient Reduction (Nonpoint Source) and Recreational Use

Category of Projects consider for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Public Health and Safety
Coastal Development and Land Use													
Marsh creation projects	S-	S-L+	S-	S-L+	NE	S-L+	S-L+	NE	NE	S-L+	NE	S-L+	L+
Roadway improvement and maintenance	S-L-	S-L-	S-	S-L-	NE	S-L-	S-	S-	S+	NE	L+	S-	S-L+

Notes:

- Adverse effect: -
- Beneficial effect: +
- Short-term effect: S
- Long-term effect: L
- No effect: NE

5.2.5.3 CUMULATIVE IMPACTS ANALYSIS

Generally speaking, cumulative impacts for Group 5 are expected to result in potential adverse, long-term impacts that are primarily minor in nature and associated with marine infrastructure maintenance and improvement activities common in the area, such as dredging activities to maintain waterways and boat slips and activity associated with oil and gas transfer and production (see Table 5.2-10). Long-term beneficial impacts could result from other activities in the area aimed at coastal restoration. Although alternatives in Group 5 could result in small incremental contributions to impacts in terrestrial and marine habitats (potential introduction of invasive species), these projects are proposed by LDWF and would be included in their ongoing maintenance and monitoring management. Overall, Group 5 alternatives would incrementally contribute to long-term benefits to socioeconomics, tourism and recreation, and infrastructure.

5.2.6 Group 6: Atchafalaya Vermilion HUC

Group 6 consists of seven alternatives: one nutrient reduction alternative and six recreational use alternatives (Table 5.2-11).

5.2.6.1 AFFECTED RESOURCES

Resource impacts associated with Group 6 alternatives are summarized in Table 5.2-11. In general, both short-term and long-term impacts for Group 6 alternatives are associated with most resources, with the exception of air quality and invasive species, which would only experience adverse, short-term impacts. Adverse, long-term effects to resources are expected to be minor, primarily associated with increased human activity, direct conversion of habitat to small structures, or increased waste or improperly disposed fishing gear from recreational use. Overall, beneficial long-term impacts are expected for socioeconomics, tourism and recreation, infrastructure, and public health and safety. Multiple resources would be affected by short-term impacts during construction.

5.2.6.2 CUMULATIVE ACTION SCENARIOS

Based upon review of information available for Group 6, the types of projects and actions are reflected in Table 5.2-12.

Table 5.2-11. Summary of Impacts of Alternatives in Group 6

Alternatives	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Nutrient Reduction and Management on Cropland and Grazing Lands in Iberia, St. Mary, and Vermilion Parishes	S- L+	S- L+	NE	S- L+	S -L+	S- L+	NE	L-	L+	NE	NE	NE	S+ L+	S- L+
Improvements to Grand Avoille Boat Launch	S- L-	S- L-	S-	S-	S-	S-	S-	L-	L+	L+	L+	S- L+	NE	S- L-
Chitimacha Boat Launch	S- L-	S- L-	S-	S- L-	S-	S-	S- L-	L-	L+	L+	S- L+	S- L+	NE	S-
Palmetto Island State Park Improvements	S- L-	S-	S-	S- L-	NE	S-	NE	L-	L+	L+	L+	S- L+	NE	S- L-
Cypremort Point State Park Improvements	S- L- +	S-	S-	S- L- +	S-	S-	S-	L-	L+	L+	L+	S- L+	NE	S- L- +
Atchafalaya Delta Wildlife Management Area Access	S- L-	S-	S-	S- L+	S-	S- L+	S- L-	L-	L+	L+	L+	S-	NE	S-
Atchafalaya Delta Wildlife Management Area Campgrounds	S- L-	S-	S-	S- L-	S-	S-	S- L-	L-	L+	L+	L+	S- L+	NE	S- L-

Notes:

- Adverse effect: -
- Beneficial effect: +
- Short-term effect: S
- Long-term effect: L
- No effect: NE

Table 5.2-12. Other Actions in Group 6 identified for Cumulative Impacts Analysis

Category of Projects Considered for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Restoration Related to the DWH Oil Spill														
Statewide Artificial Reefs	S-	S-L+	S-	S-L+	S-	S-L+	S-L+	S-	NE	S-L+	S-	S-	NE	S-
Tourism and Recreation														
Park upgrades: walk/bike paths, lighting, boat ramp improvement/maintenance; camp and cabin improvement, boardwalks	S-L-	S-L-	S-	S-L-	S-	S-L-	S-L-	S-	S-L+	S-L+	L+	S-L+	NE	S-L+
Marine Transportation														
Dredging, slip maintenance and improvement, bulkheads, breakwaters, propwash	S-L-	S-L-	S-	S-L-	S-L-	S-L+	S-L-	S-L-	S+L+	S-	L+	S-	NE	S-L-
Energy Activities														
Oil and gas pipeline and well activity	S-	S-	S-	S-L-	S-	S-L-	S-	L-	S+L+	S-L+/-	S-L+	L-	S-L-	NE
Marine Mineral Mining, Including Sand and Gravel Mining														
Excavation for borrow	S-L-	S-L-	S-	S-	S-	S-L-	S-L-	S-L-	NE	NE	NE	L-	S-L-	NE
Dredged Material Disposal														
Drainage maintenance and improvement projects	S-	S-L+	S-	S-L-	NE	S-	NE	L-	S+L+	NE	L+	S-	S-L+	L+
Levee construction and maintenance	S-	S-L+/-	S-	S-L+/-	NE	S-L+/-	S-L+/-	S-	S+L+	S-L+	L+	S-	S-L+/-	L+
Placement of maintenance and new work dredged material	S-L-	S-	S-	S-L-	S-	S-L+	S-L-	S-L-	NE	S-L+/-	NE	S-L+	NE	NE

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Nutrient Reduction (Nonpoint Source) and Recreational Use

Category of Projects Considered for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Coastal Development and Land Use														
Nonstructural risk reduction projects (CPRA MP)	NE	NE	NE	NE	NE	NE	NE	NE	L+	NE	L+	NE	NE	L+
Marsh creation projects (CPRA MP)	S-	S-L+	S-	S-L+	NE	S-L+	S-L+	NE	NE	S-L+	NE	S-L+	NE	L+
Structural protection (CPRA MP)	S-L+/-	S-L-	S-	S-L-	NE	S-	S-L-	S-	S+L+	S-L+	L+	S-	L+	L+
Shoreline protection (CPRA MP)	S-L+/-	S-L+/-	S-	S-L+	S-L+/-	S-L+	S-L+/-	NE	NE	S-L+	NE	S-L+	NE	L+
Beneficial use of dredged material	S-	S-L+	S-	S-L+	NE	L+	S-L+	S-	NE	S-L+	NE	L+	NE	NE
Commercial, residential, and other development	S-	S-L-	S-	S-L-	NE	S-L-	S-	S-L-	S+L+	NE	S-L-	S-L-	S-	NE
Roadway improvement and maintenance	S-L-	S-L-	S-	S-L-	NE	S-L-	S-	S-	S+	NE	L+	S-	S-L+/-	S-L+
Fisheries and Aquaculture														
Creation and maintenance of crawfish ponds and associated facilities	S-	S-	S-	NE	NE	S-L+	NE	NE	L+	NE	NE	NE	NE	NE

Notes:

- Adverse effect: -
- Beneficial effect: +
- Short-term effect: S
- Long-term effect: L
- No effect: NE

5.2.6.3 CUMULATIVE IMPACTS ANALYSIS

In general, cumulative impacts for Group 6 are expected to result in potential adverse, long-term impacts that are primarily minor in nature and associated with infrastructure improvement and activities common in the area, such as excavation for borrow material, dredging activities, roadway maintenance and improvement, and development (see Table 5.2-12). Most of the adverse impacts are associated with marine activity, oil and gas activity, and drainage/flood protection activity. The alternatives in Group 6 potentially have a small incremental contribution to impacts to geology and substrate, hydrology and water quality, and terrestrial, coastal-nearshore, and marine habitats. However, it should be noted that multiple activities within the area, such as marsh creation, beneficial use of dredged material, shoreline protection, and creation and maintenance of artificial reefs, contribute beneficial impacts to these resources. Potential long-term contributions to beneficial effects from Group 6 alternatives consists of socioeconomics, tourism and recreation, land use, and public health and safety.

5.2.7 Group 7: Calcasieu Mermentau HUC

Group 7 consists of four alternatives: two nutrient reduction alternatives and two recreational use alternatives (Table 5.2-13).

5.2.7.1 AFFECTED RESOURCES

Resource impacts associated with Group 7 alternatives are summarized in Table 5.2-13. In general, both short-term and long-term impacts for Group 7 alternatives are associated with most resources, with the exception of air quality and invasive species, which would only experience adverse, short-term impacts. Adverse, long-term effects to resources are expected to be minor, primarily associated with increased human activity, direct conversion of habitat to small structures, or risk of spills from watercraft. Overall, beneficial long-term impacts are expected for socioeconomics, tourism and recreation, and infrastructure. Coastal nearshore and marine species may experience minor, adverse, short-term impacts from increased human activity and loss of small amounts of habitat to structures but would also experience potential long-term benefits by providing increased habitat for species. Multiple resources would be affected by short-term impacts during construction.

5.2.7.2 CUMULATIVE ACTION SCENARIOS

Based upon review of information available for Group 7, the types of projects and actions are reflected in Table 5.2-14.

Table 5.2-13. Summary of Impacts of Alternatives in Group 7

Alternatives	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Winter Water Holding on Cropland in Vermilion and Cameron Parishes Plus Agricultural Best Management Practices	S- L+	S- L+	NE	S- L+	S- L+	S- L+	NE	L-	L+	NE L+	NE	NE	S+ L+	S- L+
Winter Water Holding on Cropland in St. Mary, St. Martin, Iberia, Lafayette, Acadia, and Jefferson Davis Parishes	S- L+	S- L+	NE	S- L+	S- L+	S- L+	NE	L-	L+	NE L+	NE	NE	S+ L+	S- L+
Sam Houston Jones State Park Improvements	S- L-	S-	S-	S-	NE	S-	NE	L-	L+	L+	S- L+	S- L+	NE	S- L-
Rockefeller Piers and Rockefeller Signage	S-	S-	S-	S- L-	S-	S-	S-	L-	L+	L+	L+	S- L+	NE	S- L-

Notes:
 Adverse effect: -
 Beneficial effect: +
 Short-term effect: S
 Long-term effect: L
 No effect: NE

Table 5.2-14. Other Actions in Group 7 Identified for Cumulative Impacts Analysis

Category of Projects consider for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Restoration Related to the DWH Oil Spill														
Lake Charles Science Center and Educational Complex	S- L-	S- L-	S-	S- L+	NE	S- L+	L+	NE	S+ L+	L+	S-	NE	NE	S-
Tourism and Recreation														
Park upgrades: walk/bike paths, lighting, boat ramp improvement/maintenance	S-	S- L-	S-	S-	S-	S-	S-	S-	S- L+	S- L+	L+	S- L+	NE	S- L+
Marine Transportation														
Dredging, slip maintenance and improvement, bulkheads, breakwaters, proppwash	S- L-	S- L-	S-	S- L-	S- L-	S- L+	S- L-	S- L-	S+ L+	S-	L+	S-	NE	S- L-
Marine Mineral Mining, Including Sand and Gravel Mining														
Excavation for borrow	S- L-	S- L-	S-	S-	S-	S- L-	S- L-	S- L-	NE	NE	NE	L-	S- L-	NE
Dredged Material Disposal														
Drainage maintenance and improvement projects	S-	S- L+	S-	S- L-	NE	S-	NE	L-	S+ L+	NE	L+	S-	S- L+	L+
Levee construction and maintenance	S-	S- L+/-	S-	S- L+/-	NE	S- L+/-	S- L+/-	S-	S+ L+	S- L+	L+	S-	S- L+/-	L+
Placement of maintenance and new work dredged material	S- L-	S-	S-	S- L-	S-	S- L+	S- L-	S- L-	NE	S- L+/-	NE	S- L+	NE	NE

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Category of Projects consider for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Coastal Development and Land Use														
Nonstructural risk reduction projects (CPRA MP)	NE	NE	NE	NE	NE	NE	NE	NE	L+	NE	L+	NE	NE	L+
Marsh creation projects (CPRA MP)	S-	S-L+	S-	S-L+	NE	S-L+	S-L+	NE	NE	S-L+	NE	S-L+	NE	L+
Ridge restoration (CPRA MP)	S-L+	S-L+	S-	S-L+	NE	S-L+	S-L+	S-	NE	NE	NE	S-L+	NE	L+
Hydrologic restoration (CPRA MP)	S-	S-L+	S-	S-L+	NE	S-L+/-	S-L+/-	S-L-	NE	S-L+	S-L+	S-L+	NE	L+
Shoreline protection (CPRA MP)	S-L+/-	S-L+/-	S-	S-L+	S-L+/-	S-L+	S-L+/-	NE	NE	S-L+	NE	S-L+	NE	L+
Beneficial use of dredged material	S-	S-L+	S-	S-L+	NE	L+	S-L+	S-	NE	S-L+	NE	L+	NE	NE
Commercial, residential, and other development	S-	S-L-	S-	S-L-	NE	S-L-	S-	S-L-	S+L+	NE	S-L-	S-L-	S-	NE
Roadway improvement and maintenance	S-L-	S-L-	S-	S-L-	NE	S-L-	S-	S-	S+	NE	L+	S-	S-L+/-	S-L+
Agricultural practices, irrigation, harvest, pest control, cattlewalks, and gator egg harvest	S-L-	S-L-	S-	NE	NE	S-L+	NE	NE	L+	L+	S-	S-	NE	S-

Notes:
 Adverse effect: -
 Beneficial effect: +
 Short-term effect: S
 Long-term effect: L
 No effect: NE

5.2.7.3 CUMULATIVE IMPACTS ANALYSIS

Cumulative impacts for Group 7 are generally expected to result in potential adverse, long-term impacts to the physical and natural environments that are primarily minor in nature and associated with infrastructure improvement and activities common in the area, such as excavation for borrow material, dredging activities, agricultural practices, roadway maintenance and improvement, and development. Long-term beneficial impacts could result from other activities within the area related to coastal restoration efforts. The alternatives in Group 7 could result in a small incremental contribution to adverse impacts to geology and substrates, hydrology and water quality, and coastal-nearshore, and marine habitats. Group 7 alternatives may also result in a small incremental contribution to long-term beneficial effects to socioeconomics, tourism and recreation, and infrastructure in the area.

5.2.8 Group 8: Lower Red HUC

Group 8 consists of two nutrient reduction alternatives (Table 5.2-15).

5.2.8.1 AFFECTED RESOURCES

Resource impacts associated with Group 8 alternatives are summarized in Table 5.2-15. In general, long-term impacts for Group 8 alternatives are beneficial for geology and substrates, hydrology and water quality, coastal and nearshore habitats, terrestrial and migratory bird species, land use and agriculture, and public health and safety. Adverse, short-term impacts are expected for most resources except for those to which no impacts are anticipated. Air quality, coastal species, tourism and recreation, and infrastructure would not be affected by the Group 8 alternatives, thus these categories have been removed from consideration in Group 8 cumulative effects analysis.

5.2.8.2 CUMULATIVE ACTION SCENARIOS

Based on review of information available for Group 8, the types of projects and actions identified are summarized in Table 5.2-16.

Table 5.2-15. Summary of Impacts of Alternatives in Group 8

Alternatives	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Marine and Estuarine Fauna	Invasive Species	Socioeconomic Resources and Environmental Justice	Tourism and Recreational Use, including Recreational Fishing and Hunting	Infrastructure	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Nutrient Reduction on Cropland and Grazing Land in Concordia, Catahoula, and Tensas Parishes	S- L+	S- L+	NE	S- L+	S- L+	S- L+	NE	L-	L+	NE	NE	NE	S+ L+	S- L+
Winter Water Holding on Cropland in Concordia, Tensas, and Catahoula Parishes	S- L+	S- L+	NE	S- L+	S- L+	S- L+	NE	L-	L+	NE L+	NE	NE	S+ L+	S- L+

Notes:

Adverse effect: -

Beneficial effect: +

Short-term effect: S

Long-term effect: L

No effect: NE

Shaded columns represent resource categories removed from consideration for that group.

Table 5.2-16. Other Actions in Group 8 Identified for Cumulative Impacts Analysis

Category of Projects Considered for Cumulative Impacts Analysis	Geology and Substrates	Hydrology and Water Quality	Air Quality and GHGs	Terrestrial, Coastal-Nearshore, and Marine Habitats	Protected Species	Terrestrial Wildlife, including Migratory Birds	Invasive Species	Socioeconomic Resources and Environmental Justice	Aesthetics and Visual Resources	Land Use and Agricultural Resources	Public Health and Safety
Tourism and Recreation											
Wildlife refuge management activities	NE	L+/-	NE	L+	L+/-	L+	L+	L+	NE	NE	NE
Energy Activities											
Oil and gas pipeline activity	S-	S-	S-	S-L-	S-L-	S-L-	L-	S+L+	L-	S-L+/-	NE
Development and Land Use											
Logging activities (silviculture)	S-L-	S-	S-	S-L+/-	S-L+/-	S-L+/-	S-L-	S+L+	L-	NE	S-
Commercial, residential, and other development (rural)	S-	S-L-	S-	S-L-	S-L-	S-L-	S-L-	S+L+	S-L-	NE	NE
Roadway improvement and maintenance	S-	S-	S-	S-	S-L-	S-L-	S-	S+L+	S-	S-	S-L+
Agricultural practices, irrigation, harvest, pest control	S-L-	S-L-	S-	NE	S-L+/-	S-L+	NE	S+L+	S-	NE	S-

Notes:
 Adverse effect: -
 Beneficial effect: +
 Short-term effect: S
 Long-term effect: L
 No effect: NE

5.2.8.3 CUMULATIVE IMPACTS ANALYSIS

Potential cumulative impacts for Group 8 are expected to result in potential adverse, long-term impacts to physical and environmental resources caused by direct conversion of habitat, primarily associated with development or oil and gas activities, rural development, and some agricultural practices (Table 5.2-16). However, the alternatives in Group 8 would not contribute to those adverse impacts. Group 8 alternatives could provide an incremental contribution to beneficial effects to socioeconomics, land use, agricultural resources, and public health and safety in the area.

6 COMPLIANCE WITH OTHER LAWS AND REGULATIONS

In addition to the requirements of OPA and NEPA, other laws may apply to the alternatives in this RP/EA. The LA TIG would ensure compliance with these relevant authorities, which are listed in Sections 6.1 and 6.2. Whether, and to what extent, an authority applies to a future project depends on the specific characteristics of a particular project and the presences of specific resources.

Examples of applicable federal and state laws or federal executive orders include, but are not necessarily limited to, those listed in this section. Additional federal laws may apply to the alternatives considered in this RP/EA. Legal authorities applicable to restoration alternative development are fully described in the context of the DWH restoration planning in the Final PDARP/PEIS, Section 6.9, Compliance with Other Applicable Authorities, and Final PDARP/PEIS Appendix 6.D, Other Laws and Executive Orders. That material is incorporated by reference in this section.

6.1 Additional Federal Laws

Additional federal laws may apply to the preferred alternatives considered in this RP/EA. Federal laws, regulations, and executive orders (EO) that may be applicable include the following:

- Endangered Species Act (16 USC 1531 et seq.)
- Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801 et seq.)
- Marine Mammal Protection Act (16 USC 1361 et seq.)
- Coastal Zone Management Act (16 USC 1451 et seq.)
- National Historic Preservation Act (16 USC 470 et seq.)
- Coastal Barrier Resources Act (16 USC 3501 et seq.)
- Migratory Bird Treaty Act (16 USC 703 et seq.)
- Bald and Golden Eagle Protection Act (16 USC 668 et seq.)
- Clean Air Act (42 USC 7401 et seq.)
- Federal Water Pollution Control Act (CWA) (33 USC 1251 et seq.) and/or Rivers and Harbors Act (33 USC 401 et seq.)
- Marine Protection, Research and Sanctuaries Act (16 USC § 1431 et seq. and 33 USC §1401 et seq.)
- Estuary Protection Act (16 USC 1221-1226)
- Archaeological Resource Protection Act (16 USC 470aa-470mm)
- National Marine Sanctuaries Act (16 USC 1431 et seq.)
- Farmland Protection Policy Act (7 USC §§ 4201 – 4209)
- EO 11988: Floodplain Management (augmented by EO 13690, January 30, 2015)
- EO 11990: Protection of Wetlands
- EO 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- EO 12962: Recreational Fisheries
- EO 13112: Safeguarding the Nation from the Impacts of Invasive Species
- EO 13175: Consultation and Coordination with Indian Tribal Governments
- EO 13186: Responsibilities of Federal Agencies to Protect Migratory Birds
- EO 13693: Planning for Federal Sustainability in the Next Decade

Federal environmental compliance responsibilities and procedures in Section 9.4.6 of the Trustee Council SOP would be followed (Trustee Council 2016). Following these standard operating procedures, the Implementing Trustee for each project would ensure that the status of environmental compliance (e.g., completed versus in progress) is tracked through the Restoration Portal. Implementing Trustees would keep a record of compliance documents (e.g., ESA biological opinions and USACE permits) and ensure that they are submitted for inclusion to the administrative record.

For the alternatives under this RP/EA, the LA TIG is currently seeking technical assistance with the regulatory agencies. Once technical assistance is complete, the LA TIG will initiate consultations and/or reviews needed to comply with applicable laws. A status update of these reviews will be provided in the Final RP/EA.

6.2 State and Local Laws

The LA TIG would ensure compliance with all applicable state and local laws and other applicable federal laws and regulations relevant to the State of Louisiana. Additional laws and regulations are listed as follows:

- Archeological Finds on State Lands (La. Rev. Stat. 41:1605)
- Coastal Wetlands Conservation and Restoration Authority (La. Rev. Stat. 49:213.1)
- Coastal Wetlands Conservation and Restoration Plan (La. Rev. Stat. 49:213.6)
- Louisiana State and Local Coastal Resources Management Act (La. Rev. Stat. 49:214.21 – 214.42)
- Louisiana Oil Spill Prevention and Response Act (La. Rev. Stat. 30:2451 et seq.)
- Management of State Lands (La. Rev. Stat. 41:1701.1 et seq.)
- Louisiana Coastal Resources Program (La. Admin. Code 43:700 et seq.)
- Louisiana Surface Water Quality Standards (La. Admin. Code 33.IX, Chapter 11)
- Management of Archaeological and Historic Sites (La. Rev. Stat. 41:1605)
- Oyster Lease Relocation Program (La. Admin. Code 43:I, 850-859, Subchapter B)

6.3 Summary and Next Steps for Preferred Alternatives

The LA TIG would ensure compliance with all applicable state and local laws and other applicable federal laws and regulations relevant to the proposed restoration alternatives, including technical assistance from appropriate regulatory agencies during E&D evaluation to identify any compliance issues. The LA TIG has started coordination and reviews for protected species and their habitats under the ESA, EFH protected under Magnuson-Stevens Act, marine mammals under the MMPA, migratory birds under the MBTA, eagles under the BGEPA and consistency with the Coastal Zone Management Act, cultural resources under the NHPA, permits under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act, and other federal statutes, where appropriate. Wherever pre-existing consultations or permits are present, they would be reviewed to determine if the consultations/permits are still valid or if a re-initiation of the consultations is necessary. Implementing Trustees are required to implement alternative-specific mitigation measures (including BMPs) identified in this RP/EA and completed consultations/permits. Oversight, provided by the Implementing Trustees, would conduct due diligence with regard to ensuring no unanticipated effects to listed species and habitats occur, including ensuring that BMPs are implemented and continue to function as intended.

6.3.1 Preliminary Finding of No Significant Impact

In this RP/EA, the LA TIG addresses NEPA requirements by tiering from environmental analyses conducted in the Final PDARP/PEIS, evaluating existing analyses, and preparing environmental consequences analyses for the alternatives as appropriate. Based on the programmatic analysis provided by the Final PDARP/PEIS, consideration of the environmental consequences in this RP/EA, and the proposed mitigation measures, the LA TIG's preliminary findings indicate that the alternatives evaluated in this RP/EA would not result in any significant impacts on the human environment in accordance with the guidelines for determining the significance of proposed federal actions (40 CFR 1508.27). If, after public comments are addressed and the preliminary findings are confirmed, the LA TIG will issue a finding of no significant impact appended to the Final RP/EA.

7 RESPONSE TO PUBLIC COMMENT

This section will be populated with a summary of the response to public comments received from the Draft RP/EA public review period. The detailed response to public comments will be attached in an appendix to the Final RP/EA.

8 PREPARERS AND REVIEWERS

8.1 List of Preparers and Reviewers

Table 8.1-1. List of Preparers and Reviewers

Agency/Firm	Name	Title/Document Role
State of Louisiana		
Louisiana Department of Wildlife and Fisheries	Todd Baker	Assistant Chief
Louisiana Department of Wildlife and Fisheries	Brady Carter	Program Manager of Fisheries Habitat Section
Louisiana Department of Wildlife and Fisheries	Tracy Mancuso	Administrative Program Specialist
Louisiana Department of Environmental Quality	Adrienne Gossman	Environmental Scientist 4
Louisiana Department of Environmental Quality	Stephanie Braden	Environmental Scientist Sr.
Louisiana Department of Environmental Quality	John Sheehan	Environmental Scientist Sr., Nonpoint Source
Louisiana Coastal Protection and Restoration Authority	Annie Howard	Coastal resources scientist, project manager
Louisiana Coastal Protection and Restoration Authority	Matt Mumfrey	Attorney
Environmental Protection Agency		
EPA Office of Water	Tim Landers	Environmental Protection Specialist
EPA Region 6	Doug Jacobson	Environmental Protection Specialist, Louisiana Team Leader
EPA Office of General Counsel	James Bove	Attorney Advisor
EPA Assessment and Watershed Protection Division	Gale Bonanno	Associate Division Director
National Oceanographic and Atmospheric Agency		
NOAA Restoration Center	Christina Fellas	DWH Environmental Compliance Coordinator/Biologist
NOAA Restoration Center	Ramona Schreiber	DWH NEPA Coordinator
NOAA Restoration Center/Earth Resources Technology, Inc.	Courtney Schupp	Marine Habitat Resource Specialist
U.S. Department of Agriculture		
USDA-NRCS	Ronald Howard	Program Specialist
USDA-NRCS	Mark Defley	Biologist
Department of Interior/USFWS		
DOI	David Reeves	Science Policy Fellow
DOI	Robin Renn	DWH NEPA Coordinator
DOI	Kevin Reynolds	Designated Natural Resource Trustee Official – Louisiana Trustee Implementation Group
DOI	John Tirpak	Louisiana Restoration Area Coordinator

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Nutrient Reduction (Nonpoint Source) and Recreational Use*

Agency/Firm	Name	Title/Document Role
Contractor Team		
SWCA Environmental Consultants	Coleman Burnett	Project manager, environmental planner/senior project manager, lead author
SWCA Environmental Consultants	Whitney Fiore	Senior NEPA specialist, project manager/lead author
SWCA Environmental Consultants	Amanda Nicodemus	Deputy project manager, project coordinator/author
SWCA Environmental Consultants	Chelsea Murphy	Natural resources project manager, OPA lead/author
SWCA Environmental Consultants	Wes Mattox	Archaeologist/ principal investigator, cultural resources lead author
SWCA Environmental Consultants	Jonathan Riggs	Environmental planner, socioeconomics lead author
SWCA Environmental Consultants	Nate Wojcik, Ph.D.	Ecologist, geology, soils, substrates lead author
SWCA Environmental Consultants	Meggan Dugan	Environmental planner/biologist, biological resources author/be author
SWCA Environmental Consultants	David Steed	Senior natural resources planner/author
SWCA Environmental Consultants	Patrick Blair	Environmental planner, author
SWCA Environmental Consultants	Patty Riley	Senior project manager, author
SWCA Environmental Consultants	Sue Wilmot	Project manager/NEPA specialist, author/QA/QC
SWCA Environmental Consultants	Ryan Rausch	Phoenix and Tucson planning lead/author
SWCA Environmental Consultants	Evan Dulin	Wetland scientist/biologist/author
SWCA Environmental Consultants	Aaron Dugas	Environmental specialist, BE lead/author
SWCA Environmental Consultants	Caitlyn Elric	Environmental specialist/BE author
SWCA Environmental Consultants	Steven Johnson, Ph.D.	Senior ecologist/BE author
SWCA Environmental Consultants	Nicole Smolensky, Ph.D.	Environmental specialist, BE QA/QC
SWCA Environmental Consultants	Linda Burfitt	Senior editor/document lead
SM&E	Angela Love	Senior scientist/Gulf Coast environmental leader, deputy project manager/cumulative resources lead author

9 REPOSITORIES

9.1 List of Repositories

Table 9.1-1. List of Repositories

Location	Street Address	City	Zip Code
St. Tammany Parish Library	310 West 21st Avenue	Covington	70433
Terrebonne Parish Library	151 Library Drive	Houma	70360
New Orleans Public Library, Louisiana Division	219 Loyola Avenue	New Orleans	70112
East Baton Rouge Parish Library	7711 Goodwood Boulevard	Baton Rouge	70806
Jefferson Parish Library, East Bank Regional Library	4747 West Napoleon Avenue	Metairie	70001
Jefferson Parish Library, West Bank Regional Library	2751 Manhattan Boulevard	Harvey	70058
Plaquemines Parish Library	8442 Highway 23	Belle Chasse	70037
St. Bernard Parish Library	1125 East St. Bernard Highway	Chalmette	70043
St. Martin Parish Library	201 Porter Street	St. Martinville	70582
Alex P. Allain Library	206 Iberia Street	Franklin	70538
Vermillion Parish Library	405 East St. Victor Street	Abbeville	70510
Martha Sowell Utley Memorial Library	314 St. Mary Street	Thibodaux	70301
South Lafourche Public Library	16241 East Main Street	Cut Off	70345
Calcasieu Parish Public Library Central Branch	301 West Claude Street	Lake Charles	70605
Iberia Parish Library	445 East Main Street	New Iberia	70560
Mark Shirley, LSU Ag Center	1105 West Port Street	Abbeville	70510

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